

**US ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
WORK INSTRUCTION 4-01-01
TO PREVENT STORMWATER POLLUTION**

PURPOSE OF THIS WORK INSTRUCTION 4-01-01

The purpose of this Work Instruction is to protect the waters within the geographic responsibilities of the Sacramento District of the Corps of Engineers from potential stormwater pollution generated by the US Army Corps of Engineer’s construction projects. This document is intended to provide a fundamental overview on the NPDES general permit process for planning personnel, engineers, specification writers, project managers, construction representatives and other Corp’s personnel. Technical references, training requirements, engineering guidelines, individual responsibilities, and general instructions to field personnel are also provided.

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BACKGROUND

This new Work Instruction is the result of a Notice of Violation written by the US EPA on the District's Lower American River Levee Improvement Project in 2000. In response to the NOV, a stormwater committee was organized in the District and the committee discovered that the process used to develop the contract specifications was flawed because the responsibility of permit compliance was simply assigned to the construction contractor without identifying any specific requirements in the contract. The specification guide in SpecIntact (Section 01356) has now been upgraded to require that the contract specifications must identify several new requirements. One of the most important new requirements includes detailed specification of the best management practices (BMPs) to control erosion and sedimentation. The committee has agreed that this Work Instruction is also necessary to disseminate vital technical information for Corps personnel who may not be familiar with the NPDES process and to ensure that Corps personnel have the proper tools to assume the primary responsibilities of permit compliance.

NPDES OVERVIEW

The California State Water Resource Control Board (SWRCB) regulates discharges to storm drains, groundwater or surface waters through the National Pollutant Discharge Elimination System (NPDES) which was established by the Federal Clean Water Act. A typical construction project involves a potential discharge to a nearby body of water during a storm event. In California, the project is regulated under a Stormwater General Permit if the total of all phases of that project disturbs 5 or more acres. The Stormwater General Permit requires the site owner to (1) Submit a Notice of Intent (NOI) to the SWRCB, (2) develop a Stormwater Pollution Prevention Plan (SWPPP), (3) Describe the Best Management Practices (BMPs) to prevent stormwater pollution in the SWPPP, (4) Inspect and maintain the BMPs (5) Submit a Notice of Termination (NOT) to the SWRCB after project completion.

UNDERSTANDING THE ADVERSE ENVIRONMENTAL IMPACT FROM STORMWATER POLLUTION

US Army Corps of Engineers' Major Construction Projects may involve clearing, excavating, grading or disturbing 5 or more acres. During a rain event, water droplets impact the disturbed soil in such a way that tiny soil particles become mobilized in the rain runoff. This muddy water drains into the rivers and streams where fish habitat and spawning areas are located. Sensitive species or young may be seriously stressed, resulting in a reduction in aquatic populations. Construction contractors who are not familiar with this adverse environmental event may not appreciate the extent of damage being done as it is not immediately apparent or highly visible. To appreciate this process, imagine dumping silty water into a home aquarium containing a variety of aquatic fauna and flora. If the sedimentation is severe enough, it can be expected that there will be a decrease in fish population in this aquarium. This muddy water has an adverse impact on aquatic life that is somewhat similar to heavy smog or smoke to humans. There are other adverse environmental impacts such as a nutrient release which triggers algae blooms, an organic material release which triggers dissolved oxygen depletion that may cause fish kills, and weakening nearby salmon during the seasonal salmon runs.

The Clean Water Act and the General Stormwater Permit under NPDES are the regulations that are designed to prevent this adverse event from occurring. The US Army Corps of Engineers has a duty to protect the environment on all construction projects.

UNDERSTANDING THE DIFFERENCE BETWEEN EROSION CONTROLS AND SEDIMENTATION CONTROLS.

Erosion control is the most important best management practice (BMP) to prevent stormwater pollution. This type of BMP is intended to prevent the initial mobilization of soil particles during a rain event by covering the loose soil with mulch, straw, geotextile fabric or other material. Generally, the best erosion controls are natural vegetation since the vegetation slows down the impact velocity of the water droplets. The root system also stabilizes the soil. Tackified straw has been identified as one cost effective erosion control BMP if newly planted vegetation will not be fully established before the rainy season. Erosion controls are always preferred over sedimentation controls.

Sedimentation controls are utilized to supplement the erosion control BMPs or if it is impractical to install any erosion control measures. Sedimentation controls assume soil mobilization has already occurred and therefore a filtering or settling system is necessary. Typical sedimentation controls are silt fences and straw wattles (fiber rolls). Sedimentation controls are most likely to be used when (1) vegetation is still in the process of being established, (2) construction work is still in progress, or (3) additional controls are considered necessary in order to supplement erosion controls since erosion control measures may not be 100% effective.

THE CALIFORNIA NPDES PERMIT REQUIREMENTS

The General Permit is posted at: <http://www.swrcb.ca.gov/stormwtr/construction.html>

Compliance with the General Permit consists of the following actions:

- (1) Submit a completed Notice of Intent (NOI) form with a site map, and a filing fee (\$250 or \$500), to the State Water Resources Control Board (SWRCB)
- (2) Implementation of a Storm Water Pollution Prevention Plan (SWPPP) for the site. This SWPPP must identify all erosion and sediment controls. These controls are called “Best Management Practices” (BMPs). The actual locations within the project site where the BMPs must be installed must be identified in the SWPPP.
- (3) The SWPPP must identify other BMPs that will eliminate potential non-stormwater discharges into storm drains and other water bodies. Examples of non-stormwater discharges are chemical spills, fuel oil or grease contamination, leaking storage tanks, etc
- (4) The SWPPP must include a monitoring program and an inspection procedure.
- (5) Annually certify, based on inspections, that the site is in compliance. Submission of color codes site maps and an annual certification fee (\$500) are required.
- (6) When the project is completed and permanent vegetation has been established, then a Notice of Termination (NOT) and site photographs must be submitted.

Major exceptions and conditions to the General Permit:

- (1) Construction activities disturbing less than 5 acres do not require this permit.¹
- (2) Disturbing is intended to mean clearing, grading, excavation, facility installation or removal, and any removal or replacement of soil. Installation or removal of new access roads must be included in the 5 acres. Existing access roads do not count as long as the roads are in good condition and stormwater pollution will not occur on the existing roads during the construction activity.
- (3) Indian Lands are outside the scope of State regulation and the General Permit. Instead these lands are regulated by EPA. Regulatory authority may be delegated to the applicable Tribe.
- (4) Lake Tahoe Hydrological Basin has a separate special permit.
- (5) Any project in which a “Individual” Permit has been issued. Individual Permits are rare and most Corps projects are under the General Permit.

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- ¹Verbal conversations with the regulators indicate that the 5 acre requirement may be reduced to 1 acre in the future.
 - In 2001, the general permit is undergoing public review to impose a special monitoring program for nearby bodies of waters that are listed as Section 303d “impaired bodies of water” for sedimentation. This special monitoring program consists of collecting water samples to determine the effectiveness of the erosion and sedimentation BMPs.
 - Since some of these Permit requirements are now undergoing changes, Corps personnel must verify the current requirements at the above listed homepage. The contract specifications must comply with the current permit requirements.

SACRAMENTO DISTRICT'S PERMIT PROCEDURE

The NOI is normally submitted during the plan and specification development phase which is prior to award of a construction contract. Early NOI submission is not recommended since a year may elapse before the contract is awarded and therefore this will require paying a needless annual certification fee. The Lead Designer² in Engineering Division should submit the NOI so that he can become familiar with the general permit requirements published in the above SWRCB homepage. The SWRCB will reply to the NOI by sending a "NOI receipt" that includes a Waste Discharge Identification Number (WDID). The WDID means the construction project is now permitted and therefore compliance with all stormwater pollution requirements are now mandatory. The WDID number is programmed into the state's database for tracking and is also sent to the state field inspectors who may visit the site for compliance.

After the contract is awarded and the Notice to Proceed is issued, the contractor must submit a certified SWPPP to the Corp's construction project engineer for review. During construction, construction project engineer must ensure compliance with the contract specifications and the requirements in the certified SWPPP. Construction-Operations Division is also responsible to submit the annual certification and NOT.

For 2001, Improvements to the Corps' process are summarized as follows:

- (1) Identification of all technical reference documents and training requirements in this Work Instruction.
- (2) Upgrade of the guide specification which will include the selection of erosion and sedimentation BMPs. The Lead Designer must verify applicability of these BMPs in the guide specifications.
- (3) A mandatory stormwater meeting must be held to finalize the selection of erosion and sedimentation BMPs. This meeting must involve the Project Manager, the Lead Designer, Landscape Architect, Environmental Engineer, Environmental Resource team member, and other appropriate disciplines.
- (4) Since the erosion and sedimentation control BMPs will be specified explicitly in the contract, installation by the contractor is now mandatory.
- (5) Upgrade of the SWPPP in the guide specification. The Lead Designer must provide additional site specific information in the SWPPP. After the contract is awarded, the contractor must certify the SWPPP and complete certain information that are not available prior to the award of the contract. This process is described in this document.
- (6) The contractor-submitted SWPPP must be approved by the government.
- (7) General Guidelines on the SWPPP and contract specifications are provided for both the Lead Designer and Construction Project Engineer in this Work Instruction.

² For the purpose of this document, "Lead Designer" is intended to be that person directly involved in writing the contract specifications. A Landscape Architect, an A/E consultant, an Environmental Engineer, a project engineer, or a technical team leader may be considered the "Lead Designer" if he or she is the person who will be writing the actual BMP specification in the contract. This is also consistent to a recent COE HQ policy of identifying the lead project engineer or technical team leader as the "Lead Designer".

GUIDELINES FOR SUBMITTING THE NOI

1. The Notice of Intent (NOI) consists of the following:
 - A. Completion of a 2 page form.
 - B. Attaching a site map of the construction project.
 - C. Attaching a \$500 check payable to the State Water Resources Control Board.
(A \$250 check may be applicable to certain counties as listed in the permit.)
2. The responsibility of processing the NOI should be accomplished by the Project Manager or the Lead Designer. The Lead Designer may delegate this task to Environmental Engineering branch or another support organization. The form requires basic information on the project and is generally self-explanatory. The form can be downloaded at <http://www.swrcb.ca.gov/stormwtr/construction.html>. (click construction activities general permit). The NOI must be certified by the District Commander or his authorized representative. The POC on the NOI form should be the Project Manager.
3. Generally, the state board will provide a receipt with a Waste Discharge ID Number (WDID) within 2 to 3 weeks. The WDID number must be recorded on the SWPPP and also on the Annual Certification and the NOT as described below.

GUIDELINES FOR SUBMITTING AN ANNUAL CERTIFICATION

1. The annual certification is a blank form sent by the SWRCB to the District requesting certification that the construction site is still in compliance. The form provides blank spaces for updated information and certification on the construction project.
2. If the contract has been awarded, the responsibility of processing the annual certification should be accomplished by the Project manager. Annual Certification form and invoices are mailed to the POC listed in the NOI. Completion of this form is generally self-explanatory. In some cases, the annual fee is paid separately by an Invoice mailed from the SWRCB before the request for annual certification is mailed. This form also requires certification by the District Commander or his authorized representative that the site is in compliance. A walk-thru inspection must be conducted.

GUIDELINES FOR SUBMITTING A NOTICE OF TERMINATION (NOT)

1. After vegetation is fully established using the criteria identified in the Permit, a NOT must be submitted by the Project Manager or Construction Project Engineer³. The NOT is necessary to cease the annual certification of the site. The Project Manager or the Construction Project Engineer may delegate this task to another support organization. Completion of this form is self-explanatory. The NOT form may be downloaded from <http://www.swrcb.ca.gov/stormwtr/construction.html>.
2. Certification by the District Commander or authorized representative on the NOT is required. Photographs are also required to show that the vegetation is fully established.

³ The Construction Project Engineer is normally the Resident Engineer or his designated field representative acting for the Resident Engineer.

REGULATORY ENFORCEMENT

The State Water Resource Control Board (SWRCB) has primary responsibility for managing the General Permit but the Regional Water Quality Control Boards (RWQCB) are responsible for enforcing the Permit requirements. A RWQCB inspector has authority to inspect any construction site for compliance. If the site is not in compliance, the inspector may issue one of the following: (in order of increasing severity)

- Notice to Comply (NTC)
- Notice of Violation (NOV)
- Cease and Desist Order (CDO)
- Administrative Civil Liabilities (ACL)

An ACL may be up to \$10,000 per day or up to \$10 per gallon.

Generally, if the site is in compliance, an inspection report may be issued which may identify some minor deficiencies. A minor deficiency does not warrant a formal NTC, NOV, CDO or ACL but a minor deficiency should be corrected as soon as possible. An example is an out-of-date construction schedule that is attached to the SWPPP. This minor deficiency is common due to the dynamic nature of a construction project.

Sacramento District personnel should be aware that these enforcement actions are simply necessary to protect the environment. To avoid these enforcement actions, Sacramento District personnel must be familiar with the potential adverse environmental impact and the requirements identified in this Work Instruction, attend the training, and then invoke the necessary stormwater controls within their specific responsibilities.

ENGINEERING GUIDELINES FOR CONTRACT SPECIFICATION DEVELOPMENT

1. The Lead Designer should submit the NOI as described earlier and then obtain a copy of the San Francisco California Regional Water Quality Board Erosion and Sediment Control Field Manual, 3rd Ed, July 1999 in the District's technical library.⁴ In a meeting with the regulators in December 2000, this manual was verbally concurred as a "user-friendly" guidance document for the proper selection and implementation of stormwater BMPs. This document will be referenced as the SFRWQCB Field manual.

2. The Lead Designer should supplement the information in the SFRWQCB Field Manual by attending some training before actually selecting the proper BMPs in the contract specifications. The training classes are described in the TRAINING paragraph below. If any Lead Designer is unable to attend these training classes prior to specification development, consultation with a co-worker who has attended this training is appropriate. The Lead Designer or the Project Manager also has the option to reassign this responsibility to the Landscape Architect or Environmental Engineering Branch.

3. The guide specifications (Section 1356) identifies a default BMP for erosion control as tackified straw and a default BMP sedimentation control as straw wattles (also called fiber rolls). The reason for these default BMPs is to give the Lead Designer a starting point in identifying the proper erosion and sedimentation controls in the contract specifications. If the Lead Designer determines that tackified straw and straw wattles are applicable and this is confirmed in the mandatory stormwater meeting described below, then no major changes should be necessary. Tackified straw and straw wattles were chosen as the default BMPs because they are easily applied, relatively inexpensive, and generally acceptable by the regulatory agencies. The SFRWQCB Field Manual illustrates tackified straw and straw wattles on page 40 and 47. The Lead Designer should estimate the number of square feet of tackified straw and the number of linear feet of straw wattles for cost estimating purposes. The erosion and sedimentation BMPs should be identified as a separate line item in the contract bid sheet.

4. The Lead Designer must be familiar with certain circumstances where tackified straw is NOT applicable:

- If the slope is very steep, the tackified straw may be difficult to install. The higher runoff velocity may also wash away the tackified straw during a storm event. In this case, the more expensive fiber blankets or geotextiles should be considered.

- If the slope forms a potential runoff artery where runoff water can converge into a relatively high volume or high velocity flow path, then fiber blankets or geotextiles should be considered. In situations where the water volume or velocity is expected to be extremely high, PVC piping should be considered to carry the water in the runoff artery.

⁴ To obtain a personal reference copy of the SFRWQCB Field Manual, see Training and Technical Reference Section.

5. The Lead Designer should be familiar with the differences between silt fences and straw wattles (fiber rolls).

- Silt fences and straw wattles generally serve the same purpose in sedimentation control. However, fiber rolls are generally preferred due to its pedestrian friendliness, and are used in a more permanent situation such as winterization where all construction work will cease for the entire winter. Silt fences are not preferred for winterization purposes because several rain events and high wind may eventually deteriorate the fabric and a flood event is likely to wash away silt fences that are installed near a river bank. Silt fences may be used for winterization if vegetation is being planned and the vegetation is expected to be fully established before the silt fences deteriorate. Silt fences are less expensive than straw wattles but silt fences must be inspected and repaired more often than straw wattles during the winter. It should be noted that the Permit and the SWPPP requires periodic inspections of the BMPs for deterioration. Maintenance and repairs of the BMPs will be the responsibility of the contractor. Generally, if tackified straw is selected for erosion control for winterization, then straw wattles should also be used as the sedimentation control. If silt fences are determined to be more applicable to the project, then the default straw wattles specification in the contract must be deleted.

6. The Lead Designer should be familiar with certain erosion and sedimentation BMPs that are now prohibited:

- Straw bales are not acceptable due to a history of poor performance.
- Soil compaction is prohibited because soil erosion will still occur.

7. The SFRWQCB Field Manual illustrates Straw Bales on page 67 and Compacted Soil on page 26. The SFRWQCB Field Manual will be revised to delete these BMPs. Verbal conversations with regulators and recent training have confirmed that Straw Bales and soil compaction should not be used. Any construction site with only compacted soil and straw bales will draw the attention of a Regional or State inspector.

8. The increasing staffing levels at the RWQCB make it more likely that large projects will receive an inspection for NPDES compliance between 1 October to 31 March, whether or not rainfall is expected. If inadequate BMPs or no BMPs have been installed, a NOV will probably be issued. Erosion prevention and sedimentation controls are therefore critical and must be included in each contract under a separate line item. This draws attention to the importance of NPDES compliance and the need to consider stormwater pollution prevention costs in bid preparation. It is to be expected that the cost of implementing adequate BMPs for NPDES compliance will be 1% to 3% of the total project cost. For example, a project that in the past would have been estimated at \$10M would now be estimated approximately \$100K higher.

9. Although the erosion and sedimentation BMPs are considered critical in preventing the release of stormwater pollution, and therefore must be identified as a

separate contract specification for emphasis, visibility and cost estimating, there are other BMPs that the Lead Designer must be familiar with:

- a. Heavy equipment tends to track mud onto public roads. If the site is located near residential property or any areas that drain into a potential stormdrain, stream or river, the Lead Designer must specify that the contractor must set up a tire wash station and/or periodically clean the ingress and egress areas and/or install sandbags around the stormdrains to trap sedimentation. This is illustrated on page 51 to 53 in the SFRWQCB Field Manual. This may be specified by updating the SWPPP (section 14) in the guide specification rather than a separate contract specification.
 - b. General Site and Material Management is a separate section in the SFRWQCB Field manual. The Lead Designer should review this section for applicability and modify the SWPPP (section 14) prior to the project advertising for bids. These General Site BMPs includes (1) management of demolition materials, (2) control of hazardous or non hazardous material imported to the construction site, (3) concrete washout areas, (4) management of portable toilets and (5) proper storage of raw material. These BMPs may be specified in the SWPPP (SWPPP Section 14) in the guide specification rather than a separate contract specification since the SWPPP will be part of the contract and the cost is relatively low. For example, if concrete work is being planned, then a concrete washout area must be identified in Section 14 of the SWPPP.
 - c. Engineering Pamphlet 1110-1-16 is a Handbook for the Preparation of a SWPPP issued by the Headquarters US Army Corps of Engineer. This is another useful guidance document for identifying BMPs in Section 14 of the SWPPP. Engineering Pamphlet 1110-1-16 is discussed later after the TRAINING section in this Work Instruction.
10. Prior to hydroseeding or applying tackified straw, some sloped areas should be prepared by vertical track-walking to reduce runoff velocities as shown on page 26 and 27 in the SFRWQCB Field Manual.

DEVELOPMENT PROCESS OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

1. The SWPPP is intended to be attached to guide specification, Section 01356 (Stormwater Pollution Prevention Measures) in SpecIntact.
2. The following ten SWPPP sections are already completed in the guide specification:

Table of contents

(Section 1) Objectives

(Section 2) Implementation

(Section 3) Availability

(Section 4) Required Changes

(Section 7) Stabilization Requirements

(Section 10) Post Construction Stormwater management

(Section 11) Maintenance, Inspection, Repair requirements during construction

(Section 15) Public Access requirements

(Section 17) Annual Certification

3. The following five SWPPP sections must be completed by the Lead Designer:

NOTE: *italics* are written in the SWPPP to serve as a guide for the Lead Designer. All italics in the SWPPP must be changed to non-italic fonts (or deleted) after revision by the Lead Designer to suit the project conditions. All non-italics are generic and therefore no changes are necessary.

(Section 5A) Project Description - Narrative description of the project.

(Section 6) Erosion Control – This must be consistent with the contract specification and the mandatory stormwater meeting.

(Section 8) Sedimentation Control – This must be consistent with the contract specification and the mandatory stormwater meeting.

(Section 14) Other Plans – This describes other BMPs such as a tire wash area, sandbagging nearby storm sewers, or any specialized BMPs unique to the site, etc

(Attachment 2) Site Maps – Color Coded maps showing the site drainage patterns, location of erosion control BMPs and location of sedimentation control BMPs. An example of the Color Coded maps are available on SPK homepage,

4. The following six SWPPP sections must be completed by the Contractor:

Cover - The contractor must complete the blanks on the cover.

(Section 5E & 5F) Toxic and Non-Toxic Material Information – The contractor must identify all toxic and non-toxic material that will be imported to the site and the BMPs associated with that toxic or non-toxic material.

(Section 9) Non-Storm management – The contractor must identify Spill Control Plan, Contractor's Emergency Notification Plan, and general operational procedures.

(Section 13) List of On-site SWPPP coordinators – The contractor must identify key personnel responsible for stormwater pollution prevention and record their training.

(Section 16) SWPPP Certification – The contractor must certify the SWPPP.

(Attachment 3) – The contractor must attach a schedule for BMP installation.

5. SWPPP Development Guidelines for the Lead Designer:

Lead Designer is responsible for completing the five SWPPP sections prior to award of the contract. All five sections should be self-explanatory except for Section 14. The Lead Designer must consult the SFRWQCB Field Manual to determine if any additional BMPs (the need for a tire wash area, concrete washout area, etc) are applicable and if applicable, must be specified in Section 14. The Lead Designer should also verify applicability of the ten sections already completed in the guide specification. It may be necessary to update the table of contents of the SWPPP. The color coded drainage maps must show the location of the erosion and sedimentation BMPs and the drainage patterns at the site. An example of a color coded drainage map is posted on the SPK homepage at <http://www.spk.usace.army.mil/what/envir/envir.html>.

6. SWPPP Review Guidelines for Construction Project Engineer:

The contract specifications will require that the contractor must complete the SWPPP (i.e. the five sections as described earlier and verify applicability of the other sections). The contract specifications also require the contractor to submit a certified SWPPP to the Corps for review and approval within 10 working days after the receipt of a notice to proceed. Construction Project Engineer must review the five SWPPP sections submitted by the contractor and provide government approval. The Construction Project Engineer has the option to request support from Engineering or the Project Manager to provide comments on the SWPPP. The five sections should be self-explanatory except for Section 9. The Construction Project Engineer should consult the SFRWQCB Erosion and Sedimentation Control Field Manual (General Site and Material Management Tab) to determine if the Non-Stormwater management described in Section 9 submitted by the contractor is consistent. Generally, spill control measures and hazardous waste management is covered in the contractor's Environmental Protection Plan per Spec 01355. The contractor must submit identical information under Section 9.

It is essential that the Construction Project Engineer verify that the SWPPP is certified by the contractor (i.e. signed) and ensure that the contractor will follow the construction schedule for BMP installation.

MANDATORY STORMWATER MEETING TO FINALIZE THE EROSION AND SEDIMENTATION CONTROLS IN THE CONTRACT SPECIFICATIONS

1. Prior to this meeting, team members (i.e., the project manager, lead designer, landscape architect, environmental engineer, environmental resource team member, construction project engineer) must be familiar with this Work Instruction, the Guide Specifications (Section 01356) and the attached SWPPP and the SFRWQCB Erosion and Sedimentation Control Field Manual. Attending the training classes described in this Work Instruction is strongly recommended.
2. The purpose of the stormwater meeting is to discuss and finalize the erosion and sedimentation controls that will be installed on the project. Other BMPs identified in the SWPPP should also be discussed if there are any specific controversial issues or specialized situations.
3. This mandatory stormwater meeting should be scheduled approximately one or two months before actual contract award.
4. Landscape Architect personnel must be involved because some erosion control BMPs may not be consistent with any planned vegetation.
5. It should be recognized that some projects may have fully established vegetation before the rainy season. This may preclude the need to identify any permanent erosion control BMPs. Therefore, schedule and timing issues must be discussed.
6. Any situation in which an informed decision cannot be made, the project manager should solicit technical personnel with previous stormwater experience. If necessary, the regulatory agencies should be consulted if the project may evolve in such a way that a high risk to the environment may occur.
7. All team members must agree with final erosion and sedimentation controls being specified in this contract. Experience has indicated (such as the Napa River Flood Control Project) that such a meeting is likely to define BMPs acceptable to the regulators.
8. The Construction Project Engineer should attend this meeting to advise on the constructibility of the BMPs. The environmental resource team member shall attend this meeting to ensure no conflict with NEPA, EIS requirements.
9. After this meeting, the Lead Designer must invoke the erosion and sedimentation BMPs in the contract and then complete the information required in the SWPPP.

TIMING ISSUES AND ENVIRONMENTAL RISKS ISSUES

1. The rainy season is generally between Oct 1 to Mar 31. The ideal situation is to have vegetation fully established prior to Oct 1 which will avoid the costly installation of erosion control BMPs. In practice, this ideal situation may not occur and therefore planning is necessary if work must proceed past Oct 1.
2. The Lead designer should review the Guide Specifications (Section 1356) which describes certain timing and risks issues that the contractor must adhere to. This includes the need to phase construction to minimize exposed soil, 14 day time requirement to install erosion control BMPs after construction is completed, etc.
3. If a decision is made to conduct construction or vegetation planting past Oct 1, the Lead Designer must select the erosion and sedimentation BMPs to support this

- activity. If the site is located a good distance from a body of water or a storm drain, then a series of sedimentation controls (i.e. not just a single silt fence) can be installed during the time when there are no erosion controls. However, if the site is located immediately next to a body of water where only a single silt fence or single straw wattle can be installed then this area represents an area of higher environmental risk.
4. For high risk areas, some consideration should be made to defer the vegetation work and instead install temporary erosion controls such as tackified straw immediately after construction. Generally, erosion protection sub-contractors, if obtained by the prime contractor, are booked solid at the beginning of the rainy season and therefore planning and coordination is necessary to minimize the number of days of having no erosion controls. Informing a state inspector that the erosion control sub-contractor is booked solid may be insufficient to avoid an NOV because it demonstrates poor planning and a lack of protection exists to the environment. Erosion control sub-contractors are listed in the yellow pages under "Erosion control" and therefore coordination with these sub-contractors should be made. This issue must be identified in the guide specification and must be addressed in the "Engineering Considerations and Instructions to Field Personnel" or during the preconstruction meeting so that Field Personnel are aware that coordination between the main construction contractor and erosion control sub-contractor is necessary to preclude a potential NOV.
 5. Lead Designers must subjectively evaluate environmental risk by conducting a site recon of the project prior to the mandatory stormwater meeting. For example, if a construction site is located a mile away from a body of water or a storm drain and the water flow will pass very slowly thru a grassy field and/or a natural settling pond, then only a single erosion BMP may be sufficient since the site may already have natural sedimentation controls. On the other hand, if the site is located immediately adjacent to a body of water that is designated impaired or there is a known nearby spawning area, then multiple and conservative BMPs are justifiable. Lead Designer must visualize how a rainfall event will drain from the site and determine the locations of sedimentation BMPs and illustrate the location of the BMPs in the plans, specification or SWPPP.
 6. Whenever possible, Landscape architects should always consider selecting a type of vegetation that is fast germinating and/or compatible with the erosion BMPs that will meet the needs of Stormwater protection of the project. Since native species normally germinate during the rainy season, irrigation may be necessary prior to the rainy season in order to establish vegetation and avoid the costs of erosion control BMPs.

SUMMARY OF PROJECT MANAGER'S RESPONSIBILITIES

- a. Be familiar with this Work Instruction and attend the training.
- d. Ensure team members have attended the training. Provide project funds to support any necessary training.
- e. Ensure that the NOI was submitted by the Lead Designer.
- f. Ensure the annual certification is completed.
- d. Ensure that the mandatory stormwater meeting occurs prior to contract award..
- e. Ensure that the contract bid schedule includes either a lump sum for all items required associated with the SWPPP requirements, or, if unit price, that appropriate quantities are specified for materials required to implement the BMP's (such as sq feet of erosion control, or linear feet of silt fence).
- f. Verify that the contract specifications invoke the erosion and sedimentation controls and consider all timing issues and environmental risk issues.
- g. Ensure the NOT is submitted when the project is completed.

RESPONSIBILITIES OF PLANNING DIVISION

- a. Be familiar with this Work Instruction and attend the training.
- b. Identify any sensitive aquatic life species or spawning areas.
- c. Determine if the nearby body of water is designated as an impaired body of water by the state since this may require a special monitoring program. The impaired bodies of waters are listed in the permit under Section 303(d). See <http://www.swrcb.ca.gov/stormwtr/construction.html>. (click construction activities general permit)
- d. Identification of any nearby "municipal separate storm sewer systems" which is called an MS4. An MS4 is usually defined as a municipal storm drain, gutter, ditch, or road drainage system which drains directly into a protected body of water.
- e. Ensure any finding from b, c, d above are turned over to the Project Manager and Lead Designer.

RESPONSIBILITIES OF LEAD DESIGNER⁵

- a. Be familiar with this Work Instruction.
- b. Attend the training. Advance training (i.e. the erosion conference described later) is strongly recommended.
- c. Submit the NOI and be familiar with the general permit.
- d. Specify the erosion and sedimentation control BMPs using this Work Instruction and the SF Field manual for guidance.
- e. Specify the other BMPs, such as Good Housekeeping BMPs, in the SWPPP using this Work Instruction and the SF Field Manual for guidance.

⁵ The lead responsibilities to specify the proper erosion and sedimentation BMPs may be reassigned to the Landscape Architect or the Environmental Engineer rather than a Civil Engineer in Civil Design.

- f. Consider timing issues and environmental risk issues. This should include the probability for construction after October 1 and considering sufficient engineering controls to ensure Permit compliance during the rainy season.
- g. Attend the mandatory stormwater meeting on stormwater prevention to finalize the erosion and sedimentation controls and SWPPP.
- h. Provide any unique stormwater protection instructions to the Construction Project Engineer via Engineering Considerations and Instructions to Field Personnel report.

RESPONSIBILITIES OF THE LANDSCAPE ARCHITECT

- a. Be familiar with this Work Instruction and attend the training.
- b. Provide consultation to the Lead Designer’s selection of BMPs.
- c. Attend the mandatory stormwater meeting on stormwater prevention
- d. Coordinate with the Lead Designer on the vegetation issues.
- e. Select the proper seed species for final or temporary erosion controls.
- f. Assume the lead responsibility of BMP specification when requested by the Lead Designer.

RESPONSIBILITIES OF THE ENVIRONMENTAL ENGINEER

- a. Be familiar with this Work Instruction and attend the training
- b. Provide consultation to the Lead Designer’s selection of the BMPs
- c. Attend the mandatory stormwater meeting on stormwater prevention, if requested by the Project Manager or Lead Designer.
- d. Assume the lead responsibility of BMP specification when requested by the Lead Designer.

RESPONSIBILITIES OF CONSTRUCTION PROJECT ENGINEERS⁶

- a. Construction Project Engineers must be familiar with this Work Instruction and attend the training. Construction Project Engineers must be familiar with the erosion and sedimentation control BMPs specified by the Lead Designer in the contract and the “Engineering Considerations and Instructions to Field Personnel”.
- b. Provide consultation to the Lead Designer’s selection of the BMPs.
- c. Attend the mandatory stormwater meeting on stormwater prevention.
- d. Construction Project Engineers must review the contractor-submitted SWPPP as described earlier in this document and provide government approval. The construction project engineer must verify that the erosion and sedimentation

⁶ The instructions for the Construction Field Engineer also apply to any US Army Corp of Engineer personnel serving as a field representative or as the on-site government liaison with the contractor.

BMPs will be installed by the contractor by reviewing the construction schedule. The Construction Project Engineer should also read the General Permit which is attached to the SWPPP.

- e. During actual construction, it is not practical to implement erosion control BMPs while heavy equipment is still moving large amounts of soil. However, the construction project engineer should be aware that temporary silt fences or straw wattles can easily be installed to control potential sedimentation at the downstream perimeter.
- f. During the rainy season, any disturbed area that will remain exposed for more than 14 days must be provided with protective erosion control measures. This “14 day requirement” is described on page 6 in the SFRWQCB Field Manual and specified in the Contract Specifications (Section 01356). Construction Project Engineer must also be aware of several due diligence requirements during construction listed as “minimize, reduce, protect and monitor” as described on page 6 in the SF Field Manual and in the contract.
- g. The SWPPP requires that the weather be monitored by the contractor continuously during the rainy season (Generally Oct 1 to Mar 31). Every attempt must be made to stabilize disturbed areas at least 48 hours before a potential storm or heavy rain event. The construction project engineer must ensure that the contractor monitors the weather by reviewing the inspection reports. Any projected incoming storms must be brought to the contractor’s attention for appropriate action. The construction project engineer should be aware that there is a requirement to inspect the project site before, during, and after a storm event.
- h. For any situation that may increase the risk to the environment, the construction project engineer should contact their in-house chain of command for an independent assessment on the situation. If necessary, the construction project engineer should contact the Project Manager or the Lead Designer or an Environmental Engineer for additional assistance. Construction Project Engineers must be familiar with the adverse environmental impact described at the beginning of this Work Instruction. Generally, if a rain event occurs and clear water can be expected to be discharged from the construction site, then the site is in compliance.
- i. The Construction Project Engineer must be familiar with the Annual Certification and Notice of Termination (NOT) requirements in the Permit as described earlier.

LESSONS LEARNED FROM TWO CIVIL WORKS PROJECTS IN 2000.

In 2000, the American River Watershed (Common Features) Project and the Napa River Flood Control Project, Contract 1A are two Civil Works projects which utilized the old process of assigning permit compliance to the contractor. The lessons learned are the basis for this new Work Instruction and are therefore documented as follows:

American River Project first drew attention from a regional inspector when a Sacramento County contractor tracked soil into a residential neighborhood through a Corps project's access gate. The RWQCB inspector issued a NTC to the Corps. The Corps corrected the deficient conditions of the NTC within a week. The RWQCB inspector later visited another Corps contract on the other side of the river, along with State and Federal EPA representatives. Although the project was within contract requirements and was instituting stormwater BMPs, the inspectors did not consider the erosion control or sediment control measures to be sufficient or installed in a timely manner. The RWQCB inspector, with the concurrence of the Federal EPA inspector, issued a NOV to the District Engineer. Claims for extra cost for the erosion control measures placed by contractors on both sides of the river have been received by SPK. LESSONS LEARNED: (1) Training is essential. A lack of awareness of the stormwater protection requirements by both Engineering and Con-Ops contributed to the NOV. (2) Any construction site with large areas of disturbed soil with little or no erosion and no sedimentation BMPs is certain to receive an NOV or even a fine. (3) Government approval of the SWPPP should now be mandatory.

The Napa River Flood Control Project had a special requirement in their Waste Discharge Requirement (WDR) which required the Corps to submit a preliminary SWPPP for regulatory review. The preliminary SWPPP was then invoked in the contract but the preliminary SWPPP still required the contractor to select the proper erosion and sedimentation BMPs. In the pre-con meeting, the contractor-submitted SWPPP was reviewed by Corps personnel and it was discovered that the contractor selected soil compaction as the erosion BMP. This was unsatisfactory to Corps personnel who were knowledgeable of the stormwater requirements. There was nothing in the contract that would force the contractor to upgrade the erosion and sedimentation BMPs. The only potential enforcement action in the contract was that the contractor was simply responsible for permit compliance. A stormwater meeting was then held to upgrade the stormwater protection BMPs and this meeting resulted in a contract modification to install tackified straw and straw wattles. The Napa River was then inspected by the state inspector and no major deficiencies were noted. LESSON LEARNED: (1) The contractor cannot be depended on to install the proper erosion and sedimentation BMPs. The contractor do not appreciate the potential adverse environmental impact and there was a conflict of interest since the contractor was attempting to save money by installing sub-standard BMPs. (2) To eliminate this conflict of interest, the erosion and sedimentation BMPs were specified explicitly in the contract mod. (3) Prior to the contract mod, a stormwater meeting was held to identify the correct stormwater protection BMPs. (4) Generally, any construction site that is covered with tackified straw and straw wattles (or any other acceptable BMPs) is less likely to receive an NOV. (5) On this project, Corps personnel had taken the stormwater training and therefore this awareness triggered a series of corrective actions which ultimately avoided an NOV.

REQUIRED TRAINING FOR LEAD DESIGNERS AND CONSTRUCTION PROJECT ENGINEERS

1. A Videotape titled “Hold on to your dirt” is now available in the Technical Library and Residence Offices.
2. Reading Technical Reference 1 and 2 may be part of a self training program for personnel involved in the detailed planning of large Civil Works Projects. Both Technical References 1 and 2 are also available in the Technical Library and Resident Offices.
3. Attending the “Construction Site Planning and Management for Water Quality Protection” seminar. This is a one day presentation by the SF RWQCB and the Friends of the Estuary given in the SF Bay area. Generally there are 6 to 8 presentations held between July and Nov each year and the tuition cost is \$80.00. Technical References 1 and 2 are provided and the videotape “Hold on to your dirt” is shown. This presentation is especially important since the regulators provide training on the do’s and don’ts in stormwater pollution prevention. This was the same training that assisted the Napa River project in 2000 and is considered required training. Project Managers and/or Section Chiefs in Con-Ops should provide training funds for technical team members.

RECOMMENDED ADVANCE TRAINING FOR LEAD DESIGNERS

1. Attending the annual International Erosion Control Association meeting on Erosion and Sedimentation Control technology. In 2001, it was held in Las Vegas in February. This is considered more advance training on the latest techniques in erosion and sedimentation controls and is strongly recommended for Lead Designers and landscape architects who are most closely associated in the actual selection of erosion and sedimentation BMPs in the contract. More information on this meeting can be obtained at <http://www.ieca.org/> (Click “conference & expo”). This homepage also provides very useful Internet information on erosion control technology to Lead Designers.

TECHNICAL REFERENCES

1. SF RWQCB Erosion and Sediment Control Field Manual (3rd Ed) July 1999. Additional manuals may be obtained for approximately \$50 by calling Friends of the San Francisco Estuary at 510-622-2419. This is a user-friendly document which provides practical guidelines in the selection of erosion and sedimentation BMPs for engineer and permit compliance issues for field personnel.
2. Guidelines for Construction Projects by the SF RWQCB. This document provides more detailed technical information on permit compliance and other permit requirements such as 401 certification and water quality certification requirements. This document duplicate most of the information at <http://www.swrcb.ca.gov/stormwtr/construction.html>.

CONSTRUCTION PROJECTS OUTSIDE OF CALIFORNIA

This document is applicable to construction projects within the state of California. For construction projects outside of the state of California, the Lead Designer must obtain the general construction NPDES permit for that state. The Lead Designer must review the permit requirements to determine whether that state has any additional requirements that are not covered by this work instruction.

The permits or a regulatory POC are located at the following homepage:

Utah:	http://www.eq.state.ut.us/eqwq/permits.html
Nevada:	http://www.state.nv.us/ndep/bwpc/storm01.html
New Mexico:	Non-NPDES state. EP 1110-1-16 is applicable.
Arizona:	Non-NPDES state. EP 1110-1-16 is applicable.

A “Non-NPDES state” is a state in which stormwater pollution prevention is regulated by the US EPA. In this case, the Lead Designer must submit a federal NOI to the US EPA as described in Engineering Pamphlet 1110-1-16. Appendix A to this Engineering Pamphlet identifies the states that are “non-NPDES” states and the appropriate POC at the US EPA. The Non-NPDES state identification is only current as of 28 Feb 1997 and therefore contacting the US EPA may be necessary to determine if the US EPA has delegated this responsibility to New Mexico and Arizona.

US ARMY CORPS OF ENGINEER’S ENGINEERING PAMPHLET 1110-1-16

This is a handbook issued by the US Army Corps of Engineers (HQ, Washington DC) to provide general guidance for the development of a federal SWPPP for Non-NPDES states such as New Mexico and Arizona. For those states, EP 1110-1-16 is applicable and takes precedent over the information provided by this Work Instruction.

However, it should be noted that there are some engineering guidelines for erosion and sedimentation controls in EP 1110-1-16 which may be useful in California. For example, Appendix C illustrates 39 Best Management Practices on highly specialized pre-engineered standards for silt fences, storm drain inlet protection, types of permanent and temporary seeding specifications, mulching, etc. These BMPs are not covered by the SF RWQCB Field manual. In some situations, the Lead Designer has the option to use some of these pre-engineered standards after verifying applicability and practicality in California. For example, the zoysiagrass establishment as described by BMP-34 in EP 1110-1-16 may not be applicable due to climate conditions at the California site.

EP 1110-1-16 may be found on SPK homepage at:
<http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-16/toc.html>

MILITARY AND HTRW PROJECTS (NON-CIVIL WORKS PROJECTS)

Generally, all construction activities on active and inactive military sites in California must comply with the General Permit. However, an active military base may have an internal stormwater pollution prevention policy and therefore the project manager should obtain any local guidance document. Construction projects on military bases must also determine if the stormwater discharge will be into a natural body of water or into a military MS4 or stormwater sewer system, which may require a separate permit.

ORIGINAL STORMWATER COMMITTEE MEMBERS

Randy Redeen	PPMD	Program Manager
Larry Dacus	PPMD	Project Manager
Victor M Chan	Engineering	Environmental Engineer
Miki Fujitsubo	Engineering	Landscape Architect (Now Fish & Wildlife)
Liz Holland	Planning	Program planner
Eric Nagy	PPMD	Project Manager
John Humbert	Con-Ops	Senior Construction Representative
Allen Curlee	Office of Counsel	Attorney

Any feedback, suggestions, comments to this document should be addressed using email or the attached form.

This Work Instruction will be revised to incorporate any new permit requirements, new corporate knowledge, or new lessons learned on stormwater protection. A feedback form is provided on the next page. Certain Federal agencies (NAVFAC, AFB Public Works, etc) have shown an interest in this Work Instruction. However, It should noted that this Work Instruction is intended for the US Army Corps of Engineers use only.

COMMENT OR FEEDBACK FORM TO THE WORK INSTRUCTION
TO PREVENT STORMWATER POLLUTION

(type or write clearly. Use back or additional sheets if necessary)

Project Description and events:

Comments, Lesson learned, or Erroneous information:

List Relevant Section of the Technical Work Instruction

Recommendations

Name/title/organization/date

All completed forms will be reviewed by the committee members or the lead technical section for potential revision of the Technical Business Practice.

Send this completed form to:

US Army Corps of Engineers, 1325 J Street, Sacramento CA 95814

ATTN: District Stormwater Committee (CESPK-ED-E, Water Quality Engineer)

The Stormwater General Permit is issued by the State Water Resources Control Board. However, the Regional Water Quality Control Boards are responsible for Permit enforcement within their regions. Any regulatory questions should be referred to these agencies listed below.

State Water Resources Control Board

1001 I Street Sacramento, CA 95814
(916) 341-5250
FAX: (916) 341-5252



Regional Water Quality Control Boards

North Coast Regional Water Quality Control Board (Region 1)

5550 Skylane Blvd - Suite A
Santa Rosa, CA 95403
(707) 576-2220
FAX: (707) 523-0135

San Francisco Bay Regional Water Quality Control Board (Region 2)

1515 Clay Street, Suite 1400
Oakland, CA 94612
(510) 622-2300
FAX: (510) 622-2460

Central Coast Regional Water Quality Control Board (Region 3)

81 Higuera St-Suite 200
San Luis Obispo, CA 93401-5427
(805) 549-3147
FAX: (805) 543-0397

Los Angeles Regional Water Quality Control Board (Region 4)

320 West 4th Street, Suite 200
Los Angeles, CA 90013
(213) 576-6600
FAX: (213) 576-6640

**Central Valley Regional Water
Quality Control Board
(Region 5)**

Sacramento Office

3443 Routier Road, Suite A
Sacramento, CA 95827-3003
(916) 255-3000
FAX: (916) 255-3015

**Central Valley Regional Water
Quality Control Board
(Region 5)**

Fresno Office

3614 East Ashlan Ave
Fresno, CA 93726
(559) 445-5116
FAX: (559) 445-5910

**Central Valley Regional Water
Quality Control Board
(Region 5)**

Redding Office

415 Knollcrest Drive
Redding, CA 96002
(530) 224-4845
FAX: (530) 224-4857

**Lahontan Regional Water Quality
Control Board
(Region 6)**

South Lake Tahoe Office

2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400
FAX: (530) 544-2271

**Lahontan Regional Water Quality
Control Board
(Region 6)**

Victorville Office

15428 Civic Dr.-Suite 100
Victorville, CA 92392
(760) 241-6583
FAX: (760) 241-7308

**Colorado River Basin Regional
Water Quality Control Board
(Region 7)**

73-720 Fred Waring Drive
Suite 100
Palm Desert, CA 92260
(760) 346-7491
FAX: 760-341-6820

LIST OF ACRONYMS

ACL	Administrative Civil Liability (an enforcement action involving a fine)
BMP	Best Management Practices (controls used to prevent stormwater pollution)
CDO	Cease and Desist Order (an enforcement action requiring a work stoppage)
IECA	International Erosion Control Association (an erosion control organization)
NTC	Notice to Comply (an enforcement action requiring compliance to the Permit)
NOI	Notice of Intent (application to obtain a permit for a planned project)
NOV	Notice of Violation (an enforcement action notifying the owner of a violation)
NOT	Notice of Termination (application to terminate coverage under the Permit)
NPDES	National Pollutant Discharge Elimination System (Part of the Clean Water Act)
PPMD	Program and Project Management Division (Project Management Division)
RWQCB	Regional Water Quality Control Board (Enforcement Regulatory agency)
SOP	Standard Operating Procedure (Now called a Work Instruction by HQ COE)
SFRWQCB	San Francisco Regional Water Quality Control Board (regulatory agency)
CVRWQCB	Central Valley Regional Water Quality Control Board (regulatory agency)
SWRCB	State Water Resource Control Board (Permit regulatory agency)
SWPPP	Storm Water Pollution Prevention Plan (A Permit requirement)
WDID	Waste Discharge Identification (Number used to identify the project)

Lead Designer - An individual selecting the Best Management Practices. A Landscape Architect, an A/E consultant, an environmental engineer, project engineer, technical team leader may be the lead designer if he or she is the individual selecting the appropriate erosion and sediment control BMP in the contract specifications.

Construction Project Engineer - Resident Engineer or his designated field representative acting for the Resident Engineer.