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June 11, 2008

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 "I" Street, 24th Floor
Sacramento, CA 95814

RE: Reissuance of the NPDES General Permit for Discharges of Stormwater Associated with Construction Activities (Construction General Permit)

Dear Ms. Townsend:

The California Department of Transportation (Caltrans) appreciates the opportunity to comment on the re-issuance of the NPDES General Permit for Discharges of Stormwater Associated with Construction Activities (Construction General Permit). This permit does not directly apply to stormwater discharges from Caltrans projects; as the State Water Board has adopted a separate NPDES permit for Caltrans projects. However, the Construction General Permit is referenced in our Statewide Permit and our Stormwater Management Plan (SWMP). We have a strong interest in the reissuance, as it will impact how we manage our unique transportation construction projects.

Caltrans (and our contracting partners) currently have approximately 600 hundred ongoing contracts statewide; ranging from smaller spot location work to larger interchange and linear projects extending many miles and crossing many drainage courses within an individual project's construction limits. We are concerned that there are elements in the permit that will be particularly difficult to comply with for large linear transportation construction projects.

A primary concern of Caltrans is the manner and timing of implementation of the new permit requirements. Caltrans believes that an exemption for on-going construction contracts[1], Corridor Mobility Improvement Account projects, Safety projects, and other essential and economically vital improvement projects is necessary for our continued mission …to improve mobility throughout California. To avoid extensive disruption of our continued highway improvement program, we suggest that an appropriate phase-in would also "grandfather" projects, which have an approved environmental document. Without an appropriate strategy for phase-in of these new permit terms we risk delivery of projects that currently include significant water quality benefits - even if they don't meet the exact terms of the Construction General Permit.

[1] Inclusive of all projects with a funding commitment voted by the California Transportation Commission

A major concern we raised in last years comments, is that the proposed permit introduces changes to the way construction projects are managed with an associated increase in cost, without a clear determination that there will be a consistent benefit through improvement in runoff water quality. Even in the absence of environmental problems, many construction sites, which would have complied with the previous permit, would have difficulty complying with this proposed permit. It will necessitate deployment of additional treatment measures to meet numeric effluent limitations, and we question whether the water quality benefit derived bears a reasonable relationship to the additional expense and effort.

We appreciate the changes that have been made to the preliminary draft. A number of our concerns have been addressed. However, we still have comments that are described in detail in the attachment; in addition we offer our responses to the Board Member Wolff's questions regarding the Draft Construction General Permit.

We hope these comments are helpful. If you have any questions, please call me at (916) 653-4446.

G. SCOTT McGOWEN
Chief Environmental Engineer
Division of Environmental Analysis

DKJ:rk

bc: Joyce Brenner; Keith Jones, Chuck Suszko-HQ Construction,
Env. File – SW, Read File

ATTACHMENT

Response to Board Questions

Our specific responses to Board Member Wolff's three questions are as follows:

1. The permit attempts to balance the need for simplicity and transparency with the need to sensitively address widely different physical conditions across sites. In what parts of the draft permit do you think complexity is most and least valuable?

   Most valuable: Conceptually, the risk based approach; however the method leads to most construction sites across the state being ranked in category Risk Level 3, rendering the value of the assessment and the nexus to water quality unclear.

   Least valuable:

   i. Receiving water assessments and monitoring are not useful or practical since many times the receiving waters are remote to the project site.

   ii. The numeric limits are not clearly linked to either water quality needs or the performance of well-managed sites. It is possible for the pH limits to be exceeded by low pH rainfall that sometimes occurs.

2. Our scientific understanding of when and where a management practice at best is limited. Self-monitoring for compliance will not necessarily increase our understanding due to variations between practitioners and for other reasons. Are you interested in creating a scientifically valid database on management practice performance via rigorous third party "random" monitoring in lieu of self monitoring and at least partially paid for by permittees?

   No, Caltrans is not interested in a database generated by "random" third party monitoring. There are too many variables for random sampling to be "scientifically" valid. We support reputable research into management practices funded by the permittees. Note, Caltrans currently conducts third party quality assurance audits of our construction sites. We also implement BMPs from our list of approved BMPs, and do not authorize the use of BMPs until they have been proven effective.

3. Ignoring the numbers and how they are calculated, do you think that the tiered compliance structure of the permit is a desirable or undesirable feature? By tiered structure, we mean action levels "backstopped" by higher numeric effluent limits that are intended to simplify enforcement against egregious violations.

   Caltrans supports action levels, but not numeric effluent limits (NELs), which are not technically feasible given the wide variation inherent with stormwater discharges. NELs and other elements of the new permit have not been field-tested. We are concerned that NELs may affect current and future Caltrans projects' compliance, and whether otherwise well-managed sites be suddenly shifted in non-compliance status.

We are further concerned, how Caltrans, as a state agency, can ensure adequate resources to implement the new permit requirements for ongoing and upcoming construction projects, considering the State's fiscal circumstances. Caltrans is in the process of evaluating the potential increase to capital project costs, resources and operating expense needs resulting from the new permit requirements.

Comments

We offer the following general comments on the Fact Sheet and the Preliminary Draft Order of the Construction General Permit. For your convenience, we have categorized the comments.

General Comments

1. **Retroactive application** – We request a "grandfather" clause be added to provide for minimum disruption and delay of on-going construction, Safety, Corridor Mobility Improvement Account and other economically vital transportation improvement projects. The Fact Sheet (pages 22 - 24) describes the projects for which this permit does not apply. We suggest this list be amended to include projects with approved environmental documents. Otherwise, it may be necessary to re-open the environmental process to address new design features and treatment facilities. This would be a significant delay to Caltrans' project delivery schedules and existing contractual obligations.

2. **Need for revised permit** – As we stated in our May 2007 comments, this revised draft does not clearly establish that the current permit terms are inadequate when a site Stormwater Pollution Prevention Plan is fully implemented. Problem identification should precede changing the program. Otherwise, significant costs will be incurred without a corresponding environmental benefit. We believe existing problems at construction sites are most likely caused by failure to implement the current permit requirements (and lack of enforcement) rather than shortcomings in the current permit approach.

3. **Assessment of risk** – We appreciate that the "Risk Based Permitting Approach" now addresses risk to waterways. It would appear that most sites will fall into a Category 3, rendering the value of the assessment unclear.

4. **Documentation requirements** – We continue to have concerns that the extensive documentation requirements will be an excessive burden to permittees, without an associated benefit to water quality.

Method of Determining Numeric Action Levels (NALs) and Numeric Effluent Limitations (NELs)

5. **Determination of pH NALs** – As we noted in our comments on the 2007 draft, the permit writers calculated **one standard deviation** (SD) above and below the mean pH of runoff from a group of Caltrans construction sites to determine the NAL. Based on this approach, the permit specifies an acceptable range of **6.5** to **8.5** pH units:

> Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units. [Fact Sheet, page 49]

The Fact Sheet presents no evidence that proper or improper operation at Caltrans projects had any relationship with the resulting pH levels. The differences in pH could just as easily have resulted from soil characteristics or pH of the rainfall. There is no intrinsic relationship between the standard deviation and either good BMPs or risk to waterways. In fact, the best-managed construction site could easily be outside the selected pH range. This is particularly true for low pH. The high pH limitation has a more substantial basis: improper handling of cement wastes, for example, can result in high pH. However, calcareous soils with high sodium can also result in elevated pH. This approach will likely place many sites (including some of those surveyed by Caltrans) outside the acceptable range because of the arbitrary application of standard deviation threshold.

Determination of pH NELs – Using standard deviations may not be the best approach for setting limitations and will likely result in well-managed sites being in violation due to natural variability. Also, the permit should allow an option to apply the assessment to a site background level instead of an absolute allowable range. This provides flexibility for assessing sites that may be outside the normal range.

For the NELs, it seems the Caltrans data was used and **three standard deviations** above and below the mean pH were selected, resulting in an allowable range of **5.8** to **9.0** pH Units. As discussed previously, the nexus to unsatisfactory management practices or to water quality impact has not been demonstrated. High pH can certainly be evidence of poor waste management practices, but we question whether pH below 5.8 indicates it and the need for treatment or corrective action at a site.

The Caltrans data on which these pH limitations are based ranged from 6 to 11.4 pH units. Many sites with conventional BMPs in place will have difficulty complying, as they will need to collect the runoff, install treatment tanks, apply chemicals to adjust the pH, and use monitoring equipment. In the Fact Sheet, we did not find evidence that construction site pH below or above the proposed limits has caused a water quality problem or has resulted from inadequate BMPs or other controls. Of course, cement wastes must be kept out of the runoff; however this issue can be addressed by mandatory BMPs.

6. **ATS turbidity limitation** – We recommend the ATS turbidity limitation be increased to be consistent with non-ATS sites. The limit appears lower than what commonly occurs in natural (un-impacted) watersheds, and will limit site options for blending effluent, when necessary.

7. **Overall assessment of compliance challenges** – We propose that the Fact Sheet include an assessment of the impact of these limitations on the construction industry in California. The NALs could require more site control corrective measures than the previous permit. The NELs could quite possibly result in additional corrective measures. As shown in Table 1, Caltrans construction site data has shown that typical Caltrans construction sites may

exceed both actions levels and effluent limits established from this data, and will therefore be out of compliance.

Table 1: Effluent Action Levels and Limitations

Constituent	Action levels	Numeric effluent limitations		[redacted]
	(NALs)	NELs	Active Treatment Systems (ATS)	[redacted]
pH	6.5 – 8.5	6 – 9.0	6 – 9.0	[redacted]
Turbidity NTU	Site specific	1,000	10 daily average	[redacted]

NM – not measured

Receiving Water Limitations

8. **Mixing zones** – Some Basin Plans provide for mixing zones. The State Board should clarify whether the receiving water limits apply at the point of discharge or after mixing (permit page 11).

9. **Exceedance of Basin Plan bacteria and CTR standards** – The permit requires the following:

> Storm water discharges and authorized non-storm water discharges shall not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan). [Permit, page 11]

Table 2 compares California Toxics Rule (CTR) and typical Basin Plan objectives for bacteria with two separate sets of Caltrans construction site runoff. As indicated by the table, exceedances are certainly possible and probably occur frequently for bacteria. The Fact Sheet should include an evaluation of the impact of this requirement.

Table 2 – Compliance of Construction Sites with Typical CTR & Bacteria WQS

Constituent	Typical Receiving Water Standards	
	1-hr average	*4-day average*
Copper, diss. ug/l	13	9
Lead, diss ug/l	65	2.5
REC-1 (Water Contact Recreation)		
Fecal Coliform MPN/100 ml	<200 log mean REC1	<400 90th percentile
Total Coliform MPN/100 ml	Median < 240	No sample > 10,000

Copper, lead objectives assume hardness = 100 mg/l as CaCO3; NM = not measured

10. **Exceedance of Basin Plan standards based on drinking water standards** –As noted above, the permit requires the compliance with all Basin Plan standards. However, in some Basin Plans, the drinking water standards, which are applicable to tap water, have been applied to surface waters with the MUN (drinking water supply) beneficial use. This can present new compliance challenges:

Some exceedances of the Basin Plan standards based on drinking water will be caused by concentrations of natural soil constituents – iron and aluminum. **Table 3** assumes a (conservative) value of 100 mg/l for TSS.[1]

Table 3 – Runoff Exceedances due to Natural Soil Constituents

Constituent	Background Concentration in California Soils (Average) (UC Riverside, 1996)	Water Quality Objectives (Drinking Water) (from SF Basin Plan, Table 3-5)
Iron	3.7%	0.2 mg/l
Aluminum	7.3%	0.3 mg/l

We therefore believe the permit should specify that where Regional Boards have applied the drinking water standards to surface waters, exceedances due to background values will not be considered a permit violation.

[1] The 2000-2001 Annual Data Summary Report, Caltrans 2002, identified a construction site runoff TSS range of 21 to 1700 mg/l, with a mean of 490 mg/l.

11. **Exceedances of other objectives based on Drinking Water Standards** – In some cases, the drinking water standards will take precedence over NALs and NELs. See **Table 4.**

Table 4 – Water Quality Standards[2] Compared with Numeric Limitations

Constituent	WQO based on Drinking Water	NEL in proposed permit	ATS
Turbidity (NTU)	5.0	1,000	10 (for ATS only)
pH	6.5-8.0	6.5-8.5	6-9.0
TDS	500.0	–	–

We feel the permit should specify that these drinking water-based standards are not applicable to construction site runoff unless the runoff presents a possible threat to a source of drinking water. Exceedances resulting from permit references to other standards are probably inadvertent and were likely not intended by the permit. Although these exceedances may not result in enforcement by the Water Boards, they do expose permittees to third party enforcement and could prevent permittees from achieving full and unambiguous compliance.

Post Construction Runoff Requirements

12. **Board approval for structural devices** – The proposed permit requires Board approval for the implementation of structural devices:

> The discharger shall, …replicate the pre-project water balance …. The discharger shall obtain Regional Water Board staff approval for the use of any structural control measures used to comply with this requirement [Permit, page 21]

This requirement is unnecessarily restrictive and could cause project delays. We do not think it would be practical to obtain Board approval for the use of all structural devices used to reduce runoff volume, and question if this approval process may result in the Water Boards' assumption of liability for performance. We also believe this clause will result in Water Boards specifying the manner of compliance, which we believe is contradictory with CWC § 13360.

Treatment Requirements – Attachment E

13. **ATS Design standards** – We appreciate the change in the ATS design standard to a 10-year storm with a 72 hr treatment time (Attachment E, 3. f). We do question the specifications for the design to be completed by a Certified Professional in Erosion and Sediment Control (CPESC). Such professionals are not able to be certified unless they have a minimum of 10 years' demonstrated construction stormwater treatment systems design experience (Attachment E, 3. a). A very limited number of

[2] From San Francisco Region Basin Plan (Table 3-5)

engineers or other professionals have this length of experience in these devices, so we propose the threshold be reduced to two years.

Risk Determination – Attachment A

14. **Receiving Water Risk Factor** – Attachment A provides a risk determination worksheet that combines the sediment risk with the receiving water risk. Permittees would benefit from understanding the results of application of this approach at locations around the state to determine if it appropriately identifies high-risk sites, particularly as related to the percentage of the 20,000 existing permits will fall in the high-risk or extreme category.

15. **Receiving Water** – The risk factor scoring should include a factor to reflect the percentage of treatment and contributing area for the project. It is too restrictive to allow the 10 point deduction only if the entire project incorporates ATS. We recommend that the point deduction be applied to any project where ATS is deployed.
16. **Sediment supply regime** – The receiving water limitations (section V) address sediment transport:

    4. Storm water discharges and authorized non-storm water discharges shall not disrupt the pre-project equilibrium flow and sediment supply regime. In cases where the pre-project flow and sediment supply regime is not in equilibrium, project related activities shall not impede the natural channel evolution process. [Permit, page 11, emphasis added]

    Controlling the sediment supply regime is a new requirement that was not addressed previously. We are concerned that adequate information is not currently available to assess the significance of this requirement. Some of our questions include: How is the sediment supply regime monitored? How is sediment to be added or removed from the stream to maintain the appropriate loading? Will sediment supplementation interfere with turbidity requirements? How is this requirement addressed if applicable receiving water standards are exceeded by the normal sediment regime (i.e., sediment loading and WQS in conflict)? What BMPs are available? What is the cost?

    It seems appropriate to assume that compliance with other permit provisions would satisfy this requirement, this would appear to be duplicative and therefore this provision should be deleted.

Monitoring and Reporting

17. Caltrans projects are linear, resulting in a significant number of discharge points within one project. Monitoring requirements at all discharge points may be impractical for transportation projects. We would like an option included for a statistical plan that provides sufficient data for assessment of effluent quality from our construction sites.

18. **Receiving Water Bioassessment Monitoring** – This should not be a project-specific requirement, and should be deleted from the permit. If this should be required, an appropriate methodology and protocol should be specified in the permit. The draft permit directs dischargers to use the California Wadable Stream method for sampling of benthic macro invertebrate (BMI), but then directs them to the SWAMP Quality Assurance Management Plan for more information on sampling collection and analysis. These two documents describe different levels of effort (and therefore cost) for the bioassessment. Which method is required? The CA Wadable Stream method typically takes about two hours of field work for one biologist to perform sample collection, while the SWAMP method can take anywhere from four to six hours, with two or three biologists.

    The draft permit also does not identify the level of analysis (identification) required for the macro invertebrate samples. There are two levels, Level 1 and Level 2, for which there is a large difference in the effort (and therefore cost). Level 1 identifies most insects to genera and Chironomidae to family. For level 1 analysis, the count for each sample is usually approximately 600 insects per sample. A 600-count sample would require roughly six hours of sorting and six hours of identification for one person. Level 2 analysis requires identification down to species (or lowest possible taxon for the specimen). For the Level 2 analysis (midges to genera, others to species), the fees for Level 2 identification are really dependent on different variables but it is typically very costly.

    In response to Board Member Wolff's question at the workshop on May 21, Caltrans believes that there are too many variables at the sites for random sampling to be 'scientific'. We would support programmatic research into management practices funded by permittees.

Procedural/Regulatory Issues

19. **Development of technology-based limitations following U.S. EPA procedures** – The permit introduces "technology-based" action levels, numeric effluent limitations, and mandatory controls (post-construction runoff). However, the Fact Sheet does not appear to contain information required by the EPA regulations for establishing these limitations. We recognize that the Fact Sheet for this draft does contain more discussion than the March 2007 draft of the regulatory factors involved in determining the technology-based limitations (BPT, BCT, and BAT). However, we feel that it still lacks the basic components of the required assessment. Example from the March 2008 Fact Sheet:

    > In addition, the [Clean Water] Act requires a cost-reasonableness assessment for BPT limitations. In determining the BPT limits, the State Water Board has considered the total cost of treatment technologies in relation to the effluent reduction benefits achieved.... In balancing costs against the benefits of effluent reduction, the State Water Boards has considered the volume and nature of expected discharges after application of BPT, the general environmental effects of pollutants, and the cost and economic impacts of the

> required level of pollution control as described in Section I.D of the Fact Sheet. [Fact Sheet, page 51, emphasis added]

However, Section I.D of the Fact Sheet refers to the "March 2007 Preliminary Draft and Subsequent Stakeholder Process" and does not appear to address either pollutant reduction or costs or economic impacts. The required assessment of pollutant reduction, costs, and overall economic impacts does not appear to be located elsewhere in the Fact Sheet or attachments.

Regarding the establishment of the BPT and BCT limits (NELS) for pH and turbidity, the Fact Sheet goes on to state that these NELs are effectively already required by the 1999 permit, and therefore no additional costs will be incurred other than monitoring:

> In other words, the additional numeric effluent limitations, compared to the existing permit's narrative effluent limitations, does not raise the bar of compliance requirements - they simply represent a point where one can quantitatively measure compliance with the lower end of the range of required technologies. Therefore, the compliance costs associated with the BPT/BCT numeric effluent limitations in this permit only differ by the costs required to measure compliance with the NELs.

Because the revised draft permit does not appear to have included any data to support this conclusion, we feel the contention that these requirements will not cost anything is not entirely accurate. In fact, since the low pH NEL is set at a level often exceeded by California rainfall, there is a real possibility of additional costs. In addition, by using the standard deviation approach, this proposed permit guarantees that projects previously considered in compliance will violate the NAL or NEL. If the 1999 permit already requires this performance, then why are the NELs necessary? Regardless, the federal regulations specify for determining best conventional pollutant control technology (BCT) it should be considered that:

> (i) the reasonableness of the relationship between the costs of attaining a reduction in effluents and the effluent reduction benefits derived; (ii) The comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources; [etc.]" 40 CFR 125.3

In addition, the Fact Sheet references best available technology economically achievable (BAT) as being the basis for the requirements. However, it does not appear to address the procedure for determining BAT. BCT would be applicable to pH, and perhaps turbidity (as a stand-in for suspended solids); BAT would apply to the chemicals used in treatment. Treatment chemicals do not appear to be discussed at all with respect to BAT.

Finally, it is still not clear that the Fact Sheet has followed 40 CFR 125.3(c) and (d) and appropriately determined the technology-based effluent limitations using a case-by-case approach.
As noted in our previous comments, the BPT/BCT/BAT procedures need to be followed. This assessment is not only mandated by the NDPES regulations, it is important because the significant changes introduced in this permit should be based on a demonstrated likelihood of environmental benefit. Without this assessment, the Boards cannot ensure that the new requirements are appropriately directed at current sources of pollutants in waterways.

20. **Policy setting** – use *Policy for the Implementation of the Stormwater Program* as the mechanism for introducing major changes. This permit significantly expands the scope of the CGP: hydromodification (post-construction runoff) controls, numeric effluent limits, etc. Such major changes should take place as part of general policy-setting process. In particular, applying hydromodification requirements outside of municipal areas is a major change that should be addressed as a new policy, rather than as simply a permit requirement. In 2005, the Board held workshops on the proposed *Policy for the Implementation of the Stormwater Program.* Although currently in abeyance, we feel that this policy-making effort is the appropriate mechanism for evaluating and introducing major changes to the stormwater program.

21. **Basin Plan prohibitions** – It may be necessary for the permit to consider a compliance schedule or other means of bringing discharges into compliance with these Basin Plan prohibitions. This proposed permit includes general prohibitions in all the Regional Basin Plans:

> III. Discharge Prohibitions
>
> 1. Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans… [Draft Permit, page 9]

For example, the San Francisco Region Basin Plan in Table 4.1 prohibits all discharges to dead-end sloughs or which do not receive 10:1 dilution. Most stormwater discharges would fall under this prohibition, since they discharge at a shoreline and do not receive the requisite dilution. The Central Coast Region Basin Plan, as another example, prohibits discharge of all wastewater to a large section of the Monterey Bay coastline (see Central Coast Basin Plan, Chapter 5. section IV.C.). These Basin Plan prohibitions were developed when stormwater was considered a non-point source discharge and was generally unregulated. The Fact Sheet (see page 26) does not appear to address these issues, although they may be prohibitive for some dischargers.

The proposed permit should address how compliance with these prohibitions will be achieved. The prohibitions are potentially part of the BCT/BAT technology-based limitations and thus should be assessed as described in the federal

regulations at 40 CFR 125.3. Regardless, if applied in practice, these prohibitions will have a major impact on projects and should be assessed in the Fact Sheet. Ideally, the Water Boards' proposed *Policy for the Implementation of the Stormwater Program* would identify which prohibitions are applicable and which are not. Otherwise, the proposed permit creates widespread "technical" noncompliance. This noncompliance may not be enforced by the Water Boards but, as discussed earlier, could be enforced by third parties.

22. **Risk Category 1 Runoff/Runon Controls** – The draft permit at Section VIII.C.2 states that, "Runon and runoff controls are not required for Risk Level 1 unless the quantity and quality evaluation deems them necessary." It is unclear how this decision would be made on a consistent basis.

23. **Permit Paragraph VIII.D.7** – The word 'not' is missing from the last sentence of this paragraph.

24. **Permit Paragraph VIII.I.2** – This sentence appears to conflict with the previous statement at VIII.I.1., which indicates that the QSP shall perform inspections rather than the 'discharger' as noted here.

25. **Permit Registration Documents** – We request that the current system for notification using a NOC be continued. The current GCP exempts Caltrans from filing for coverage beyond the submission of a Notice of Construction (NOC). Caltrans will need more than 100 days to submit the other requested documents, such as the SWPPP, electronically and designate a Legally Responsible Person (LRP). The LRP should be transferable over the life of the permit.

26. **Covering of Topsoil Stockpiles** – Permit Section VIII.F.4.a requires that stockpiles of topsoil be covered for erosion control. Caltrans is moving away from covering topsoil because of the biological consequences – it carries the potential to kill the beneficial living organisms in the soil. We suggest that the paragraph is reworded to indicate that, "source control BMPs for stockpiled topsoil" be employed.

27. **Final Stabilization Requirements** – The requirement for placement of 2" of fallen plant litter is very restrictive and does not give the landscape architect the flexibility to design the final site stabilization. We suggest that "or equal" language be added.

28. **Attachment D – Sediment Basin Design** – The design guidelines note that the sediment basin will be designed to drain within 24 to 72 hours. The Department of Health Care Services (DHS) has recently revised its vector control guidelines to allow the storage of runoff for a period up to 96 hours. We suggest that the permit incorporate this higher value for improved basin performance.

29. **Cover for Disturbed Inactive Areas** – We recommend that the State Board provide a table listing acceptable BMPs to meet an expected threshold for erosion control C value. The permit at VIII.B.3 requires the equivalent of a RUSLE "C" factor of 0.003 for all inactive disturbed areas. This is not a realistic or achievable value on a

short-term basis. The table below is from a NRCS NEH publication developed by Wischmeier and Smith. First, the *C* values are only for "*Established Plants*," not disturbed sites. Secondly, the conditions that produce a *C* value of 0.003 are for established tall grasses at 25 to 50% cover with 95% or greater surface cover of residue (thatch matt developed from dead vegetation). Note that the *C* increases as tall grass cover increases. This is attributed to the average 20% drop height.

Table 3.7
Cover Factor C Values for Established Plants
(data from NRCS NEH Chapter 3 and Wischmeier and Smith 1978)

			Percentage of surface covered by residue in contact with the soil					
	Percent Cover[1]	Plant Type	0%	20	40	60	80	95+
C factor for grass, grasslike plants, or decaying compacted plant litter	0	Grass	0.45	0.20	0.10	0.042	0.013	0.0003
C factor for broadleaf herbaceous plants (including most weeds with little lateral root networks), or un-decayed residues	0	Weeds	0.45	0.24	0.15	0.091	0.043	0.011
Tall weeds or short brush with average drop height[2] of =20 inches	25	Grass	0.36	0.17	0.09	0.038	0.013	0.003
		Weeds	0.36	0.20	0.13	0.083	0.041	0.011
	50	Grass	0.26	0.13	0.07	0.035	0.012	0.003
		Weeds	0.26	0.16	0.11	0.076	0.039	0.011
	75	Grass	0.17	0.12	0.09	0.068	0.038	0.011
		Weeds	0.17	0.12	0.09	0.068	0.038	0.011
Mechanically prepared sites, with no live vegetation and no topsoil, and no litter mixed in.	0	None	0.94	0.44	0.30	0.20	0.10	Not given

[1] Percent cover is the portion of the total area surface that would be hidden from view by canopy if looking straight downward.
[2] Drop height is the average fall height of water drops falling from the canopy to the ground.

In the erosion control testing program at the Texas Transportation Institute (TTI) , Hydraulics and Erosion Control Laboratory in College Station, TX, they have been testing the performance of all types of temporary erosion control products since 1990. These uniform tests compare the material sediment retention performance to soil loss on cohesive and non-cohesive soils. During this time they have never found a temporary product, physical or chemical that would yield a *C* value this low.

Because the testing program is focused on the transportation environment, the standard tests are for slopes of 3:1 (33%) and 2:1 (50%), which are common on many transportation projects. The performance levels established for approval of a material are given in **Table 5**.

Table 5: TTI Maximum Allowable Sediment Loss by Slope and Soil Type

Slope and Soil Type	Maximum Allowable Loss in Tons/Acre
2:1 Cohesive	1.72
3:1 Non-cohesive	62
2:1 Cohesive	4.07
3:1Non-cohesive	137

These values in **Table 5** were established using five years of testing data and using the upper 80th percentile of performance to establish minimum performance levels. Every two years these limits are reevaluated and have been reaffirmed over more than 17 years of testing.

Because straw is one of the most common and effective surface protection techniques, summary data sheets have been attached that show the evaluation of straw performance using the standard TTI protocol.

Based on TTI's experience and these data, we believe that using the C=0.003 value as a requirement for disturbed soils is an inappropriate measure altogether. Clearly, the RUSLE "Cover Factor" is strongly influenced by slope, slope length and soil characteristics that are never uniform across a site. In addition, since no single temporary erosion control product will perform at that level, the requirement is of little value and probably cannot be measured if enforcement actions are attempted.

Erosion control on a construction site must be considered as a system and not as a single management practice. Early in the revegetation process, sediment yields from newly stabilized areas will be high, which will require backup sediment controls downslope. Then, as germination and establishment of vegetation proceeds, the sediment controls will have less loading. Depending on the type of vegetation, slope, and soil, it will require two to five years to establish a surface cover system that would perform consistently at a C value of 0.003.

In some areas of the state, particularly in arid desert shrub associations, a C value of 0.003 could never realistically be expected. The measure of compliance that will best measure/monitor the sediment control of a site is the turbidity requirement.

30. **Rain Event Action Plan** - Page 47 of the fact sheet, describing the Rain Event Action Plan (REAP). The threshold listed at 0.01 inches of rainfall is much too restrictive. Since for hydrologic analyses, runoff is often not assumed to occur before 0.10 inches of rainfall (representing the "abstraction" amount), a rainfall amount between 0.10 and 0.20 inches would be a more reasonable threshold, providing a better balance between expected costs and water quality benefit.