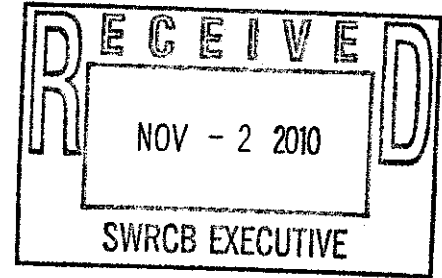


Water Resources Management

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Redmond, WA 98053-6287

November 2, 2010

Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814



SUBJECT: Comment Letter – Policy for Controlling Trash in Waters of the State

Dear Ms. Townsend,

The proposed Trash Policy will be a major undertaking and could be a significant step in achieving a consistent policy towards addressing an environmental issue that persists in virtually every municipality in the State. My comments are based on 28 years of experience working at the San Francisco Bay RWQCB implementing the State and Federal clean water laws and 20 years developing and implementing storm water management programs in the Bay Area. I am submitting comments in response to the September 27, 2010 notice regarding the scope and content of the environmental information that should be considered in developing a Statewide Policy for Controlling Trash in Waters of the State (Trash Policy). My comments focus on the following areas:

- Definition and Impacts of Trash
- Strategy for Regulation of Trash
- Lessons Learned from Regional Board's Implementation of Trash Control Programs
- Effectiveness of Certified Full and Partial Capture Systems
- Strategy for Compliance With Water Quality Standards

Definition and Impacts of Trash

It is going to be extremely important for the Trash Policy to precisely define the pollutants that are to be addressed because the sources, impacts, methods for monitoring trash loads and trash control measures will vary widely depending on the pollutants to be addressed. The Los Angeles RWQCB Trash TMDL (Trash TMDL) defined trash as man-made litter as defined in California Government Code Section 68055.1(g) and excluded sediments, oil and grease and vegetation except yard waste illegally disposed of in the storm drain system. The San Francisco Bay RWQCB in the Municipal Regional Permit (MRP) defined trash as litter and particles of litter and referenced the Government Code; however, the Code includes "other natural and synthetic materials, thrown or deposited on the lands and waters of the state." The MRP's much broader definition of trash and litter would include vegetation and sediments since they were not excluded. Caltrans in its studies defined litter as manufactured items made from paper, plastic, cardboard, glass, metal and excluded sand, gravel, vegetation.

Studies¹ of pollutant loadings in storm water runoff conducted at 24 sites in Australia found that only 14% of the total solids consist of man-made trash while sediments represents 30% and vegetation 56%

¹ Tony F Wong & Tracey Walker, Peer review and Development of a Stormwater Gross Pollutant Treatment Technology Assessment Methodology, October 2000, Monash University

of the total solids (Gross Pollutants) loading. Baseline monitoring studies² required by the Trash TMDL found that vegetation and sediment to be 84 - >99% of the Gross Pollutant loading and litter was the remaining portion. Caltrans³ found in its studies that vegetation ranged from 75 to 87% of the weight of Gross Pollutants and litter was the remaining portion. I am not aware of any studies that have determined the amount of vegetative yard waste illegally disposed into storm drain systems. I have observed extensive deposits of vegetation and sediments at Bay Area storm drain outfalls (Fig 1 & 2); observed that landscape maintenance practices – leaf blowers are a source of vegetation in catch basins; and, have received complaints that municipal leaf collection programs leave significant residuals in streets that are subsequently washed off during storm events.

Sediment and vegetation carried in storm water runoff makes it difficult and costly to obtain representative samples of the wide range of solids and to characterize the pollutants in the runoff and in determining the trash trapping effectiveness of "Partial and Full Capture Systems". The Trash Policy needs to specify standardized protocols for monitoring and characterizing trash, vegetation and sediments in storm water runoff such as those developed by ASCE⁴.

The Background Section of the Informational Document includes a good discussion of the impacts of trash on beneficial water uses and the environment; however, it would be more comprehensive if the impacts were discussed in terms of California Water Code Section 13050(k) contamination, (l) pollution and (m) nuisance. Items like medical/personal hygiene waste such as hypodermic needles, diapers; condoms, etc. pose a different threat and require higher levels of prevention of discharge and cleanup while at the other end of the spectrum minor amounts of inert trash may not be a nuisance in remote less accessible areas. There are any number of excellent readily available publications that discuss the impacts of trash on the environment that include transport of adsorbed toxic chemicals, ingestion of trash by birds, fish, turtles, whales and threats to the public health including those participating in volunteer cleanups. The Background Section needs to be significantly strengthened to support the need for the Trash Policy by expanding the discussion on impacts of trash in terms of pollution, contamination and nuisance.

The Background Section should include the list of top ten marine debris items and the amounts of trash from various activities reported for California in the Coastal Conservancy's report⁵ of the 2009 Coastal Cleanup. The Lake Merritt Institute has great information in its newsletters⁶ regarding the items cleaned up from Lake Merritt including food containers, plastic bottles, styrofoam cups and wrappers, tennis balls, basket balls, baseballs, dolls, pacifiers, bikes, tires, carburetors, license plates, garage door openers, parking signs, cash register drawers, bouquets of flowers. In addition to the above items I have observed shopping carts, furniture, mattresses, appliances, florescent light tubes, wheel weights, dead animals, etc. The list of items considered to be trash in storm water runoff needs to be significantly expanded and not just focus on plastics.

Strategy for Regulation of Trash

² County of Los Angeles Department of Public Works, Trash Baseline Monitoring Results, Los Angeles River and Ballona Creek Watersheds, February 17, 2004

³ Caltrans, Guidance for Monitoring Storm Water Litter, October 2000, CTSW-RT-00-025

⁴ ASCE-EWRI, Guideline for Monitoring Stormwater Gross Solids, 2010

⁵ Ocean Conservancy, Trash Travels, 2010 Report, International Coastal Cleanup, 25 Anniversary

⁶ The Lake Merritt Institute, Tidings – October 2010, Volume XV, Issue X

The section on Existing Regulatory Structure needs to include a discussion of the 2006 Court of Appeal, Fourth Appellate Court, Division One, D043877 decision on the appeal of the Trash TMDL. This discussion must include the key findings of the decision and the resulting implications for controlling trash through implementation of the municipal storm water NPDES Permits. This section must also include a thorough discussion of the State's policy on compliance with water quality standards and prohibitions by municipalities and the iterative process for improvement of BMPs and how that process would be applied to trash.

The discussion on BCT/BAT should include the status of the development of these standards for controlling discharges of trash from industrial sources and include the program and schedule for development of BCT/BAT for trash. It is insufficient to simply state that BAT/BCT applies to industries without including a program for development and implementation of BAT/BCT for trash in the State's general industrial NPDES Permit. The discussion on MEP must include citations of the Federal Clean Water Act requirements, EPA's guidance for implementing MEP, court decisions that have addressed MEP and the State Board's position on application of the iterative process for implementation of BMPs until compliance with water quality standards and discharge prohibitions are achieved.

The Water Quality Policy Statement under "Potential Elements Subject to Scoping Consideration" indicates that the Trash Policy would apply to MEP and BCT/BAT to the "cleanup and removal of trash from storm drain system(s)". This would be inconsistent with the Federal Clean Water Act that applies the MEP standard to the reduction in the discharge of pollutants and not to the cleanup of pollutants after they have been discharged. Cleanup of trash deposits discharged to navigable waters should be required as mitigation for failure to comply with water quality standards and discharge prohibitions and to eliminate any adverse impacts to beneficial water uses particularly where trash discharges have not been reduced to the MEP or BAT/BCT implemented.

The "No action" portion of "Element 1" should be titled "Use of Existing Policies and Procedures" because those actions are being implemented and should continue to be implemented. It is certainly a misnomer to suggest "No Action" is occurring because several of the regional boards are taking definitive steps to reduce trash discharges from municipalities. This section must also include or refer to the State Board's expectations on the application of the State's policy on compliance with water quality standards and the iterative process for improvement of BMPs that would be applied to trash.

The second item under "Element 1" should apply to the "discharges" of trash and not "cleanup and removal" of trash. This item should address the State Board's expectations on levels of cleanup to mitigate the failure to comply with water quality standards and discharge prohibitions after discharges are reduced to the MEP and described in terms of preventing pollution, hazards to public health and nuisance.

I support the concept contained in the third item regarding a trash source control policy; however, the State Board is encouraged to take a much stronger leadership role in promoting trash reduction through supporting legislation of product bans, encouraging municipalities to address "Gross Pollutants" as part of their trash control programs, providing RWQCB resources to implement regulatory programs, encouraging use of cleanup and abatement account funds to construct "full capture systems" and establishing grant and SRF funding priorities for effective "full capture systems", and use of cleanup and abatement account funds for cleanup efforts.

The Goal or Target of "Zero Trash" established in the Trash TMDL and affirmed by Fourth Appellate District Court Decision is supported by the National Research Council's recommendation for the adoption of a goal of zero discharge of waste into the marine environment including land-based marine debris, derelict fishing gear, shipborne waste and abandoned vessels.⁷ The Fourth Appellate District Court Decision further acknowledged that the target of "Zero Trash" would ultimately be reviewed to establish threshold levels needed to protect beneficial uses.

The Trash TMDL and MRP have both indicated that the levels of trash other than the "Zero Goal" may be established after there has been a significant reduction in trash loadings. An objective of "Zero Trash" in receiving waters is probably not achievable and there may be levels of trash that are not adversely affecting beneficial waters uses or causing nuisance. As an example – small amounts of inert trash in creeks flowing through private property in a remote area with limited public access would not constitute a nuisance; however, those same amounts of trash in a creek adjacent to a heavily used walking trail could be considered a nuisance.

An item must be added to the Trash Policy regarding the levels of trash that would be allowed to be discharged from the MS4s or required to be cleaned up. The Trash Policy should establish a process and procedure for determining "acceptable" levels of trash in creeks, flood control drainage systems, wetlands, estuaries and the ocean that do not constitute a nuisance, adversely affect beneficial water uses and/or cause a contamination. The science based studies to establish "acceptable" levels of trash must be conducted by independent scientific organizations such as the San Francisco Estuary Institute.

The "No action" portion of "Element 2: Water Quality Objectives should be titled "Use of Existing Policies and Practices" because these actions are being implemented and should continue to be implemented. Unless the SWRCB can overwhelmingly find that existing narrative objectives and discharge prohibitions are seriously deficient in controlling trash then there should be no attempt to develop a new water quality objective or discharge prohibitions for preventing the impacts of trash discharges. Foremost of concern is that a new water quality objective will require a time consuming process to comply with administrative process and Section 13241(d) of the Water Code. This process could easily result in a "no action" alternative for at least a decade while the new objective is developed, Basin Plans amended, NPDES Permits revised to include a new objective and programs developed and implemented to achieve compliance. The existing water quality objectives and discharge prohibitions albeit different between the RWQCBs have not been shown to be ineffective in controlling trash and must be retained and aggressively implemented.

Lessons Learned from Regional Boards' Implementation of Trash Control Programs

The discharge of trash and solid waste to the State's waters have been prohibited in water quality plans and policies since the mid 60's, Basin Plans since 1975 and have been prohibited in storm water NPDES permits for over 18 years. Municipalities in their storm water programs have been implementing maintenance practices and public education programs for over 15 years that are aimed at reducing the discharge of gross pollutants including trash. In Los Angeles concerns in the late 90's by beach front communities about impacts on recreational uses and costs of cleanup of enormous amounts of trash and studies of plastic particles found in the Mid-Pacific Gyre stimulated the regional board to develop the Trash TMDL. In the Bay Area efforts by Save The Bay Association and Guadalupe-Coyote Resource Conservation District led to extensive concerns by the public about the impacts of trash and to the RWQCB's listing of multiple waterbodies impaired by trash and specifically including trash as a pollutant

⁷ National Research Council, 2009, *Tackling Marine Debris in the 21st Century*

to be addressed in the MRP. The City of Oakland provided early implementation of trash control programs after EPA added trash as impairing the uses of Lake Merritt.

The Los Angeles and San Francisco Bay RWQCBs have implemented trash control programs taking slightly different approaches with Los Angeles RWQCB using the TMDL process to develop waste load allocation with implementation through NPDES Permits. In the Bay Area the RWQCB required reductions in trash loadings using the MRP. USEPA's role in the development and the SWRCB's review of the Los Angeles RWQCB's Trash TMDL and ultimately the Court of Appeal, Fourth Appellate District's decision have already had a major role in defining the regulatory framework and trash control requirements for both regions. The Trash Policy would benefit from a thorough review of the two approaches to determine whether other provisions of the California Water Code including direct enforcement of the NPDES Permit violations could expedite addressing the pervasive trash problem. The review should include an assessment of the staff resources required to implement different regulatory approaches.

The Los Angeles RWQCB found that the process to establish the TMDL exceedingly lengthy, heavily litigated and scrutinized and contained excessive analysis. The San Francisco Bay RWQCB MRP likewise was an exceedingly lengthy process, but likely benefited from what occurred in Los Angeles.

This review of the two approaches should also consider the response of municipalities and identify the constraints in developing and implementation of trash reduction programs. It appears that in the Bay Area the program has morphed into a "more studies" approach at the encouragement of consultants for municipalities before implementing meaningful trash control programs even with the availability of federal stimulus funds (American Recovery and Reinvestment Act of 2009). The review should assess whether sufficient information is available on the sources and loadings of trash and effectiveness of trash control measures already implemented in the Bay Area i.e. City of Oakland and Los Angeles is sufficient to proceed with installation of proven "full capture systems".

This review should also include an evaluation of the progress towards achieving the overall target/goal of "zero trash" in the Los Angeles area. The current 50% level of reduction in trash discharge required by the Los Angeles River Trash TMDL should have produced notable and measurable reductions in trash cleaned up by the City of Long Beach and during the Coastal Cleanup programs.

Another factor that seems to have been overlooked by both Regional Boards in their acceptance of catch basin inserts for controlling trash is that many land uses such as high density residential, commercial, industrial, schools, sport complexes, etc have extensive internal drainage systems with multiple storm drain inlets. An inspection in the Bay Area of three commercial shopping centers and two schools found that the number of storm drain inlets in each case to significantly exceed those on the adjacent public streets. In order for catch basin inserts to be effective for these land uses municipalities must develop and implement programs that would require installation on private property and at schools where they currently may not have authority. It is highly questionable whether the municipalities have the resources to provide periodic replacement and perform the required maintenance on their own systems much less provide the necessary level of oversight of catch basin inserts on private properties. The Trash Policy needs to address this issue and describe the program for controlling trash from these areas.

Effectiveness of Certified Full and Partial Capture Systems

Element 3 appears to be a mix of a regulatory strategy i.e. 'No action' and specification of the types of or control measures or BMPs that would be implemented by municipalities to achieve water quality standards and discharge prohibitions. The State Board in the Trash Policy must avoid the mistakes that have been made regarding the certification of "full or partial capture systems".

There are a number of concerns with certification process that was developed by the Los Angeles RWQCB and adopted and extended to many other devices by the San Francisco Bay RWQCB staff including:

- Certification process appears to be inconsistent with Section 13360(a) of the California Water Code
- Certification limits the ability to implement the State Board's Decision on use of the iterative process for achieving compliance with water quality standards and discharge prohibitions
- Design flow criteria significantly underestimates the peak flows for small catchments
- Required maintenance is not being performed or documented
- Effectiveness of "full and partial capture systems" was based on incomplete or incorrect information
- Monitoring of trash loads is required to verify compliance with the target of "zero trash" or reductions in trash loadings

Consistency With California Water Code Section 13360(a) – The certification process appears to be inconsistent with Section 13360(a) of the California Water Code that states *"No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner."* The certification process appears to place at least some level of responsibility and liability on the State for meeting the trash trapping standard. The cities/counties and their consultants should be responsible and accountable for selecting and maintaining the devices that meet the trash trapping standard and ultimately the receiving water standards and discharge prohibitions. It also undermines the RWQCB's ability to take enforcement actions when the trash reduction requirements are not achieved. The Trash Policy should examine this apparent conflict and should clearly state why the certification process is consistent with Section 13360(a) or provide the disclaimers placing the ultimate responsibility for compliance on municipalities.

Certification Process vs Iterative Process - The certification process appears to limit the ability to implement the State Board's Decision on use of the iterative process for achieving compliance with water quality standards and prohibitions. The MRP in Provision C.1.a. specifically deleted trash from the iterative process; however, it did require municipalities to achieve trash load reductions. Although the trash reduction loadings could be achieved, the water quality standards and prohibitions may not be achieved depending on the accuracy of the original trash baseline loadings. An underestimation of the original baseline loadings could leave significant amounts of trash being discharged even though the required percent reductions in the baseline loadings were achieved. The Trash Policy should carefully explain the application of the iterative process when compliance with water quality standards and prohibitions is not achieved.

Peak Flow Design Rates - The flow criteria in the Los Angeles RWQCB's definition of "full capture system" applies the Rational Equation to compute the peak flow rates; however, refers to a 30-minute isohyethan map. Using a 30-minute intensity may be appropriate for large capacity devices serving catchments that have a 30-minute time of concentration (T_c), but significantly underestimates peak flows for systems like catch basin inserts with very small (<2-acres) catchments with T_c less than 2 or 3-minutes. This approach underestimates the peak flow rate by a factor of 4-6 and could be by as much as a factor of 10. Inadequate hydraulic design capacity in addition to clogging of catch basin insert screens may be another factor contributing to the observed bypassing of trash at sites with catch basin inserts. The Trash Policy in the definition of a "full capture system" needs to develop peak flow criteria that would apply to a wide range of catchment sizes.

Maintenance of Storm Water Treatment Systems - Maintenance of storm water treatment systems is certainly the most critical element for the success of the trash control program. The Los Angeles RWQCB determined that compliance with the Trash TMDL waste load allocation would be achieved by "full capture systems" if they are adequately sized, maintained and maintenance records are up-to-date and available to the RWQCB staff. The availability of regional board staff to perform the oversight necessary to assure implementation of adequate maintenance programs is problematic. Of equal concern is this requirement would effectively preclude public review of these records. A review of the past five annual reports submitted by the Los Angeles area municipalities indicates a growing shortfall in their maintenance budgets and concerns about the maintenance program. Inspections of catch basin inserts and trash excluders over the past seven years have found serious maintenance deficiencies resulting in the significant bypass of trash from certified systems (Figures 3-8).

It is apparent that trash capture systems and particularly those that rely on direct screening are vulnerable to clogging by "scumutzdecke", blockage and bypassing and will require an extremely high level of maintenance. Several studies suggested that maintenance of catch basin inserts is required on a storm event basis and even during storm events may be required. Unfortunately relatively few studies have been conducted on the effectiveness of catch basin inserts under actual field conditions and those that have been conducted were on catch basin inserts that were designed to remove oil and grease, sediments and pollutants such as metals and organics. These studies have cited the lack of maintenance as the key factor affecting the performance of catch basin inserts. The common themes found in the studies include:

- A commitment to adequate maintenance of any system is required.
- The frequency of maintenance ranged from after every storm >0.25 inch, after one to five inches of seasonal rainfall, weekly, rarely exceeding monthly and very infrequently on an annual basis.
- Maintenance requirements and frequencies will be site specific depending on sediment and trash loads, vegetation loads that depend on season and leaf fall.
- Cleaning of screens may require use of wire brushes, power washing and even steam cleaning
- Vendors claims in many cases are not substantiated by readily available material, are often overstated and maintenance requirements understated.
- Applications should be limited to small sites where onsite personnel are available for maintenance during storm events.

The Trash Policy must address this very critical issue and specify the essential elements of an acceptable maintenance program for all "full and partial capture systems". Based on my experience an adequate maintenance program must include the following elements:

- Inspection protocols and frequency inspections are needed to identify the need for maintenance and replacement of damaged or missing components. Rainfall events will determine when inspections and cleanout is required rather than fixed schedules as used for street sweeping.
- Physical access to the system (access for is most difficult in urban areas and will be even more problematic for gaining access for catch basins.
- Access for cleaning (some devices will require additional manholes or hatches)
- Methods for cleaning (wire brushing or scraping of screens may be required, power washing and even steam cleaning to remove "scumutzdecke"
- Management of power wash water/steam cleaning residue - heavily polluted solids washed from the screens will accumulate in the storm drain and will need to be removed to prevent discharge during storm events. This cleaning will require access to the storm drain immediately downstream from the catch basin and will likely require the installation of plugs in storm drains.
- Provide for worker safety (confined space entry requirements may be needed for deep and long catch basins during installation of inserts or to achieve cleaning around inserts; expensive traffic controls will be required along major streets, arterials and expressways/freeways during installation and maintenance; protection of workers from rodents, mosquito and spiders)
- Minimize impacts on public (traffic controls, noise from vacuum trucks, parking restrictions, vermin - rats, cockroaches and mosquitoes)

The Program staff is urged to carefully review several studies on use of catch basins⁸ and ⁹ because they report on real world maintenance issues faced by the staff that are responsible for maintenance of municipal storm sewer systems and contain a number of citations to concerns with procedures and costs of maintaining systems like catch basin inserts.

The effective maintenance of storm water treatment systems is so critical to the success of the trash control program; the State Board should establish special incentives for municipalities to provide the required maintenance of these systems such as:

- Require development of the above maintenance program elements and provide long-term funding as a condition of receiving grants and loans
- Allowing municipalities to include in grants the cost of vendor maintenance of "full capture systems" for a limited period of up to five years to provide time for municipalities to develop the expertise and obtain the equipment and budget for implementing the maintenance program.
- Include the above maintenance program elements in the definition of achieving the MEP standard.
- Include "clawback" provisions in grants where municipalities fail to maintain the grant funded storm water treatment systems.

⁸ Santa Clara Valley Urban Runoff Program, October 21, 1999 Technical Memorandum, Storm Water Inlet Retrofit Feasibility Study

⁹ Woodward-Clyde Consultants, September 24, 1998, Santa Monica Bay Area Municipal Storm/Water Urban Runoff Pilot Project-Evaluation of Potential Catchbasin Retrofits

Municipalities must be required to include in their annual reports that they have implemented the details of their maintenance programs under penalty of perjury. The regional boards should document implementation of the maintenance programs through periodic inspections of the treatment systems.

A key quote from Eric Livingston head of the State of Florida storm water program: "**Storm Water Program Golden Rule - If you aren't willing to establish the institutional framework needed to assure that the storm water BMPs are properly designed, constructed, inspected, maintained and operated, DON'T REQUIRE THE USE OF BMPs**"

Effectiveness of "Full and Partial Capture Systems" - A key component of the Trash TMDL is the use of certified "full and partial capture systems" as BMPs to demonstrate compliance with the TMDL's waste load allocations. The installation and maintenance of "full capture systems" obviated the obligation to determine the actual amount of trash loading that a municipality was causing and achieved compliance with the effluent limitation (waste load allocation). A review of the application of the implementation of the certification reveals some significant shortcomings that the Trash Policy must address including: certified systems are not meeting the trapping standard, systems were approved that were not designed to prevent plugging or blockage of the screening module, and effectiveness studies were initially flawed or conducted after certification of the system that now do not meet the trapping standard.

The San Francisco Estuary Partnership's Bay Area-wide Trash Capture Demonstration Project identified a major problem with the devices that have been certified by the Los Angeles RWQCB. While they may capture trash >5-mm, they do not retain or trap the trash. The Project correctly pointed out that trash must be retained until the devices are cleaned out during routine maintenance and not allowed to bypass trash during flows that exceed the peak flow from the design storm. I do not believe that flow through systems like catch basin inserts can achieve this requirement. There is confusion with and different interpretations of the trapping standard contained in the definition of "full trash capture" being applied in Los Angeles. While a single system or series of systems may capture particles by a 5-mm screen it does not necessarily hold that they will trap and retain the particles. This interpretation is extremely important because flow through devices like catch basin inserts would need to be greatly oversized or required to be cleaned at a very significant high frequency – likely on a storm event basis to meet a trapping standard to prevent the overflow and discharge of floatables and other trash. The State of New Jersey¹⁰ has required that manufactured treatment devices including catch basin inserts that have been certified through the NJCAT Stormwater Verification/ Certification Program be installed offline pending the development of a re-suspension test protocol to address flows greater than those from design storms.

The Trash TMDL (9/19/01 version) required the Executive Officer in certifying "Full Capture Treatment Systems" to make the following findings:

- The device or systems will capture all particles retained by a 5-mm mesh screen from all runoff generated from a one-year storm (determined to be 0.6 inch per hour) and
- The device or system is designed to prevent plugging or blockage of the screening module

I could not find in any of the applications submitted for certification or in the Executive Officer's certifications evidence that the systems were designed to prevent plugging or blockage. Direct screening of storm water runoff will result in plugging of screens or filter media as documented by numerous field studies of catch basin inserts.

¹⁰ <http://www.njstormwater.org/treatment.html>

The certifications of systems issued by the Los Angeles RWQCB are conditional with the RWQCB reserving the ability to rescind the certification for subsequent installations if data demonstrate the system is not performing to the full capture design standard. This seems to be a rather hollow threat since many agencies are far into installing certified systems and it appears that no one is required to monitor and verify that the systems are effective in achieving the ultimate Trash TMDL load reduction requirement.

The City of Los Angeles in its October 19, 2006 application¹¹ for certification of horizontal and vertical screen catch basin outlet devices indicates that there has been an evolution in the types and design of catch basins ranging from hanging baskets to horizontal screens to vertical screens. The hanging baskets (Drain Pac™) tested¹² to determine trash removal effectiveness by Los Angeles County in the City of South Pasadena were found to capture some amounts of trash, but decreased with increasing flow; however, considerable amounts of trash were found in the downstream CDS unit indicating significant bypass or scouring of trash from the hanging basket insert. The City of Los Angeles in its application¹³ for certification of catch basin inserts tested both horizontal and vertical screen inserts (Practical Technology, Inc.) by installing the devices coupled with catch basin opening screen covers (trash extruders) with CDS units downstream (base of catchment) of the inserts. The City incorrectly¹⁴ concluded that the devices retain 99% of the trash that enters the catch basin over the course of the year when it failed to account for all of trash that had been trapped in the CDS units. The efficiencies of the horizontal and vertical inserts and trash excluders were likely much less than <15%. It should be noted that the City in deciding to deploy catch basin opening screen covers that leave trash in the street pending street sweeping has apparently selected to ignore its earlier concern¹⁵ that accumulation of trash in public areas leads to the "broken window theory" contributing to neglect and apathy taking root in neighborhoods fueling further deterioration and often leading to other societal ills.

The City of Glendale 2008-09 Annual Report¹⁶ indicates that it recently experienced flooding problems with some of installed BMPs (brush material and aluminum mesh extruders and horizontal screens) and is modifying or replacing these devices. The City did not further explain the extent of this problem or what modifications were made. This combined with pictures of trash impacted extruders and clogged horizontal screens installed in the City of Los Angeles suggests that these devices even combined with frequent street sweeping may not achieve the **trapping standard**.

This past winter the Los Angeles media reported flood damage attributed to areas where extruders had been installed.

¹¹ Mayor Antonio R. Villaraigosa, Letter dated October 19, 2006, Request for Full Certification of a Catch Basin Insert, http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/full_capture_certification.shtml

¹² Los Angeles County BMP Effectiveness Study, August 2005, http://www.ladpw.org/NPDES/2004-05_report/Appendices%20H-BMP%20Effectiveness.pdf

¹³ City of Los Angeles, Department of Public Works, June 2006, Catch Basin Inserts: Method to Determine CB Inserts Act as Full Capture Devices, Technical Report: Assessment of Catch Basin Inserts, Technical Report: Assessment of Catch Basin Opening Screen Covers, http://www.lastormwater.org/Siteorg/download/pdfs/general_info/Request-Certification-10-06.pdf

¹⁴ Larry P. Kolb and Roger B. James April 3, 2009 comment on MRP page 9

¹⁵ City of Los Angeles, Department of Public Works, Bureau of Sanitation, Watershed Protection Division, January 2002, High Trash-Generation Areas and Control Measures, page 2.

¹⁶ <http://ladpw.org/wmd/npdesrsa/annualreport/index.cfm>

Several studies conducted to determine the effectiveness of the Caltrans Gross Solids Removal Devices subsequent to the LA RWQCB's October 7, 2004 certification indicate that they are not meeting the trapping standard. The UC Davis study¹⁷ on pages 85 and 168 concludes that:

- The volume of gross solids that escaped through the surface louvers and captured downstream in the 5-mm screen was relatively small and consisted of leaves, other vegetation and flat wooden (popsicle) sticks that floated in the GSRD and were ejected by force of the backward directed flow leaving the louvers.
- The device generally met the requirement that litter items with dimensions larger than 0.25-inch (5-mm) are retained within the device.
- Conveyance through the louvers was reduced by accumulation of wet gross solids such as paper and cardboard.
- Loss of conveyance through the louvers occurred at high litter loading and was caused by cigarette filters becoming lodged in the openings and sheets of plastic covering significant number of them.
- Removal of gross solids from the Linear-Radial device is expected to pose significant operational problems in matters related to maintenance and litter removal.

Note that the report did not include data of the amount of material captured by the downstream screen or photos of the exterior of the device.

The Phase IV report¹⁸ of the GSRD Pilot Study on page 4-5 shows considerable trash protruding and escaping the louvered screen (Figure 9). The report in section 6.3.2 on page 6-2 indicates "The GRSD screen did not experience clogging. However, as discussed in Section 4.3.1, the bypass screen (4.75-mm) became clogged on several occasions with gross solids that had escaped the GSRD screen. Since the bypass screen would not be a feature of a permanent GSRD installation, the LR3 US-101 meets the criterion for clogging." This indicates that while the GRSD may meet the 5-mm threshold it is not achieving the trapping standard.

The LA RWQCB October 7, 2004 certification of this system as a full capture device was based on the October 2003 Phase I GSRD pilot study and indicates that the RWQCB will review and consider performance data on a continuous basis. The certification further states that it reserves the right to rescind the certification for subsequent installations in the event data demonstrate that the systems are not performing to the full capture standard established by the trash TMDL.

The certification process adopted by the Los Angeles RWQCB and endorsed by the San Francisco Bay RWQCB is clearly deficient and likely results in waste of grant funds and federal stimulus funds (American Recovery and Reinvestment Act of 2009). The certification process needs to be thoroughly reviewed and revised to ensure that any certified systems in fact achieve the trash reductions required to achieve compliance with TMDLs or NPDES Permits. The State Board should require that any certified or grant funded trash control treatment system undergo an evaluation similar to the Washington TAPE or New Jersey NJCAT programs where BMPs are independently tested pursuant to rigid monitoring and testing protocols, maintenance requirements developed with results evaluated using experts in unit processes and operations. A design review or value engineering review process similar to that for grants for waste water treatment projects also needs to be developed.

¹⁷ Bassam A. Younis, Department of Civil and Environmental Engineering, University of California Davis, May 2005, Laboratory Testing of Gross Solids Removal Devices, CTSW-RT-05-73-18.1

¹⁸ Caltrans, Final Report December 2005, Phase IV Gross Solids Removal Devices Pilot Study: 2004-2005, CTSW-TR-05-130-03.2

Monitoring to Verify Progress Toward Achieving "Zero Trash" Target and/or Achieving Reductions in Trash Loadings – It is important that the Trash Policy require municipalities and industries *in fact* reduce the discharges of trash and not rely solely on installation of certified BMPs to verify compliance with TMDLs and NPDES permits. There are far too many uncertainties with the effectiveness of "full and partial capture systems" and level of maintenance that these systems require to simply require their installation. A comprehensive monitoring program must be developed to verify that the required trash reductions are being achieved and document compliance with water quality standards and discharge prohibitions. The Trash Policy must spell out the State Board's expectations in this regard.

Strategy for Compliance With Water Quality Standards and Prohibitions

The Trash Policy must develop a strategy providing guidance to the regional boards, municipalities and industries on compliance with water quality standards for trash and control measures that achieve MEP, BCT/BAT. This guidance should address the following areas:

- Application of the State Board's iterative BMP process for achieving compliance with water quality standards regarding trash.
- Program and schedule for development and approval of BCT/BAT for controlling trash from industries.
- Implementation of control measures and/or treatment systems for achieving the MEP standard.
- Policy on cleanup of residual trash in navigable waters after the MEP and BCT/BAT standards have been implemented yet a level of "no adverse effects" on beneficial uses has not been achieved.
- Monitoring programs necessary to verify that the required trash reductions are being achieved and document compliance with water quality standards and discharge prohibitions.

The State Board in Order WQ 2001-15 in a precedent decision as discussed earlier established an iterative process for compliance with water quality objectives. The Los Angeles RWQCB has implemented that approach while the San Francisco Bay RWQCB in the MRP Order R2-2009-0074, Section C.1.a. excluded trash from the iterative process, but instead required compliance with a trash load reduction program. The State board in the Trash Policy should establish a consistent approach for addressing compliance with water quality standards and discharge prohibitions.

The Informational Document singles out the industries involved in the manufacture, transport or use of preproduction plastics while the discharge of trash can occur from multiple industrial categories. The information being developed through implementation of Section 13367 of the Water Code should provide the basis for development of BCT/BAT for controlling trash from all industrial categories. This program should include a discussion of EPA's 1992 study¹⁹ on plastic pellets and analyze why implementation of that report's recommendations have not been effective. This program should also evaluate the capabilities of the CDS device cited by the Los Angeles RWQCB as a "full capture device" to trap and retain the one millimeter (1,000- μ m) particle. The Trash Policy should include a schedule for completing these analyses and schedule for adoption of an NPDES Permit applicable to all industries and not just those industries involved in the manufacture, transport or use of preproduction plastics.

¹⁹ USEPA, Plastic Pellets in the Aquatic Environment: Sources and Recommendations, EPA 842/B-92/010, December 1992

The Los Angeles RWQCB in the Trash TMDL incorporated waste load allocations with compliance through installation and maintenance of certified full capture systems achieving the MEP standard. The San Francisco Bay RWQCB in the MRP adopted the definition of full trash capture from the Trash TMDL and found it represented a current status of MEP for trash capture. The earlier discussion on the effectiveness of the full capture devices certified by the Los Angeles RWQCB and the certification and widespread acceptance of marginal devices by the San Francisco Bay RWQCB staff as part of the San Francisco Estuary Partnership's administration of the \$5 million in federal stimulus funds (American Recovery and Reinvestment Act of 2009) to support a Bay Area-wide Trash Capture Demonstration Project raise many questions about whether the municipalities are in fact reducing discharges to the MEP²⁰.

The Trash Policy must thoroughly review whether the "certified" "full capture systems":

- Are trapping and retaining all particles removed by a 5-mm (5,000- μ m) mesh screen and has a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour, storm in the drainage area and have been designed to prevent plugging or blockage of the screening module.
- Are inspected at a frequency necessary to ensure the structural integrity and maintained and cleaned at a frequency to assure the full hydraulic design capacity and maintain a capacity of at least 60% of the solids storage area.
- Have been independently tested and are being monitored to verify that the systems are "in fact" trapping and retaining all particles \geq 5-mm (5,000- μ m) until cleaned out.
- This review should include a comprehensive evaluation of the effectiveness and realistic life cycle costs of the systems to determine their cost effectiveness considering the long-term (50-year) costs - including costs for many elements listed under the above maintenance program. The life cycle cost analysis also needs to address a municipality's costs for implementation of a program to install trash control measures on schools and private property including strip commercial developments, malls, business parks, high density residential that have storm drain systems on private property. An advantage of large capture devices would be that these land uses could be served by those devices further down in the catchment rather than catch basin inserts installed within the individual properties.

Mitigation or cleanup of remaining trash even after installation of "full capture systems" and "partial capture systems" combined with institutional controls should be an element of the Trash Policy. The iterative implementation of effective "full capture systems" should result in significant reductions in the discharge of trash protecting beneficial uses in even the most sensitive water bodies; however, partial capture systems even when combined with institutional controls will not achieve the necessary trash reductions. Cleanup and removal of trash from water bodies to levels of "no adverse effects" should be required as a policy. In sensitive water bodies such as natural urban creeks and wetlands "full capture systems" should be required because cleanup activities may not be feasible without damaging sensitive habitat or beneficial water uses. In less sensitive areas like improved flood control channels it may be possible to employ partial capture systems with cleanups required within a week after each and before any subsequent major storm event.

The effort to develop the Trash Policy should be viewed as an opportunity to thoroughly evaluate and assess the effectiveness of the regional boards' current programs to control and mitigate the impacts

²⁰ Natural Resources Defense Council et al, Comments on Draft NPDES Permit No. 0000221 for the District of Columbia to Garrison Miller, USEPA Office of NPDES Permits and Enforcement, June 4, 2010

from the discharge of trash to the State's waters and to recommend constructive changes to improve the State's trash control programs.

Sincerely,

Roger B. James
Senior Consultant

Figure 1

Deposits of Vegetation & Sediment

Eastshore State Park – University
Avenue Outfall , Berkeley

Sausal Creek Outfall - Oakland
Estuary



Figure 2

Vegetation in Storm Water Runoff

Lake Merritt - Oakland



Lake Merritt - Oakland



Figure 3

Lack of Maintenance

**Catch Basin Insert – Trash and Debris
Removed, Screen Remains Occluded**



**Catch Basin Insert -Screen
Occluded and System Bypassing**



Figure 4

Lack of Maintenance

**Catch Basin Insert – Screen
Occluded with “Scumutzdecke” –
System Bypassing**



**Catch Basin Insert – Screen “Pasted
“with Trash and “Scumutzdecke” -
System Bypassing**





Figure 5

Lack of Maintenance

Catch Basin Insert Screen Completely Occluded with ½-inch of Caked and Dried “Scumutzdecke” – Trash and Gross Pollutants Bypassing with Screen Acting as a Weir



Figure 6

**“Floating” Trash Captured and Retained by CDS Unit
Downstream from Catch Basin Inserts**



Figure 7

Malfunction of Trash Excluders

Catch Basin Inlet Extruders Held in Open Position by Trash



Trash Remaining in Street Contributing to “Broken Windows” Effect on Community



Figure 8

Effectiveness of Trash Excluders and Street Sweeping

Trash Escaping Excluder and Entering Catch Basin



Street Sweeper Misses Trash at Catch Basin Inlet



Figure 9

Gross Solids Protruding Through GRSD Screen

