Water Resources Management

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SUBJECT : Trash Load Reduction Tracking Method

Dear Geoff,

Thanks for including me on the distribution of BASMAA's committee agendas and minutes and various work products. It provides me with an opportunity to review reports prior to their submittal to the Regional Board and prior to their availability from the RWQCB for formal comments. I have attempted to review many of BASMAA's reports especially those that address the trash problem in anticipation of the Regional Board's formal request for comments. I have identified a number of issues with the November 11, 2011 draft of the "Trash Load Reduction Tracking Method" that you will find should be addressed before the document is finalized. My comments at this point focus on the proposed trash control measures listed in Table 1.1 and the Fact Sheets in Section 3.0 and a most important missing control measure.

General Comments

One of the overall purposes of the report is to provide information that will aid BASMAA's members in selecting effective full capture devices for removing trash from storm water. The concern that prompts my interest in this issue is the possibility that this report could facilitate bad decisions - bad for the cities, and bad for the environment. I have two specific concerns - that the devises selected by cities will not be effective in reducing the discharge of trash, especially after real-world usage, and that devices will not be feasible and affordable to maintain. In either case we could see our storm water collection systems littered with expensive, but useless hardware.

The reduction of trash discharged from a MS4 achieved through any control measure must be validated and trash reduction credits as a result of control measures must be based on:

- Devices that that has been independently tested and evaluated and meet the MRPs definition of Full Capture Devices; and
- Actual measurement of the amount (mass and volume) of trash removed from the MS4 discharge based on studies conducted in the Bay Area or in areas with a climate, rainfall characteristics and characteristics of trash similar to that found in the Bay Area; or
- Using the protocols adopted by the LA RWQCB for measuring the effectiveness of partial capture devices and institutional controls specified in the *Los Angeles River Watershed Trash TMDL, August 9, 2007 Final Staff Report, pages 31-33*. The study conducted by Clean Water Action is an excellent beginning point for a protocol to document trash reduction credits resulting from pre and post implementation of partial capture devices and institutional controls. The protocol needs to include the mass and volume of each component of trash and include cigarette butts.

All control measures that are population based or include per capita use factors must consider the huge influx of daily and even week long commuters into the Bay Area. The effectiveness of ordinances at the local level or even countywide to reduce single-use carryout bags, polystyrene foam food service ware and single-use food and beverage ware in the Bay Area needs to be addressed considering the high influx of commuters from outside the immediate Bay Area where similar ordinances haven't been adopted or aren't under consideration.

The project should be cautious in using data from other areas because of climate differences and even more important the differences in the characteristics of trash, environmental ethic of the population, level of community services, income levels, etc. The project has frequently referenced studies in South Africa where trash measurements are determined by 10-mm (0.40 inches) versus 5-mm in California, there is very little vegetation in storm water runoff, the lowest income level people are squatters living in shanty's in urban areas where there are no refuse collection services and trash disposal is to storm drainage channels. In South Africa household trash collection services in other income areas are unreliable and routine street sweeping is essentially limited to central business districts and is primarily performed manually. I believe that South Africa experience is a poor predictor of Bay Area outcomes.

The proposal to provide credit to early implementers of control measures prior to the MRP is confusing and needs to better explain how this would be implemented. Perhaps several examples of the proposed control measures would be helpful starting with the results of baseline monitoring, adjustments for early implementation of control measures and implementation of control measures.

Single-Use Carryout Bag Ordinance – CR-1

These control measures would provide for trash load reduction credits for ordinances covering plastic bags and all single use bags as high as 10% for plastic and 12% for single use bags. Studies have been conducted that have quantified the many different items of trash that have been found on street surfaces, in storm water runoff and cleaned up from creeks and shorelines. The reduction credits proposed by BASMAA for this control measure are extremely excessive when compared to the levels of trash actually found in these studies. The reduction credits should never be greater than what is found in the baseline monitoring, the Clean Water Action's or City of San Francisco's studies.

The Clean Water Action's *"Taking Out the Trash: A Source Reduction Pilot Project"* report considered by BASMAA's Trash Committee on June 16, 2011 counted trash on streets and adjacent areas at six different sites in the Bay Area and found that grocery/retail plastic bags represented 1.9% of all items of trash found, all plastic bags represented 4.0% and paper bags represented 1.5% of all items found. This survey did not include cigarette butts due to the immense quantity.

The City of San Francisco *"Streets Litter Re-Audit, 2208"* reported on results of 84 items of trash found on city streets during 2008 with plastic retail bags 0.64% of all large litter (4-in^2 and larger which excluded cigarette butts) in 2008 and 0.60% in 2007. Non retail plastic bags were 3.4% in 2008 and 1.11% in 2007 of all items. Paper retail bags were 0.35% in 2008 and 0.37% in 2007 and non retail paper bags were 1.08% in 2008 and 1.88% in 2007. Low counts of plastic bags likely represent the City's waste reduction and management programs including the "all plastics pickup" program.

The BASMAA initial baseline monitoring events found that plastic grocery bags represented 4 and 6 percent of all trash.

Caltrans "*District 7 Litter Management Pilot Study, CT-SW-RT-00-013"* found that Plastic-Film was 7% by weight 12% by volume and 12% by count of all litter and paper was 9% by weight, 14% by volume and 10% by count; however, the study did not determine the portions attributed to single use bags. Note that this study included cigarette butts.

Robin Allison in *"From Roads to Rivers" Report 98/6 Cooperative Research Centre for Catchment Hydrology* counted the items in litter captured by SEPTs after a period of 27 days and found plastic bags were 1.5% of all litter and paper bags were 1.7% of all litter excluding cigarette butts.

The Ocean Conservancy in*"Tracking Trash 25 Years of Action for the Ocean"* reported on 2010 results from the international cleanup of trash. In California plastic bags of all types represented 13.1% of the litter and paper bags of all types were 5.8% of all litter. It is likely that the total amount of litter collected is much less than all litter discharged from MS4s because heavier material would not be deposited in areas subject to cleanup and much of the floatable litter had migrated to coastal waters. The paper and plastic bags included both retail and nonretail bags so the actual percentages of retail bags in these two classes were not determined.

<u>Polystyrene Foam Food Service Ware Ordinance-CR-2</u>

These control measures would provide for trash load reduction credits by prohibiting distribution of polystyrene foam food service ware at permittee sponsored events or owned property or prohibit the distribution within the permittees area of jurisdiction with credits as high as 8%.

Studies have been conducted that have quantified the many different items of trash that have been found on street surfaces, in storm water runoff and cleaned up from creeks and shorelines.
The reduction credits proposed by BASMAA for this control measure are extremely excessive when compared to the levels found in the these studies. The reduction credits should never be greater than what is found in the baseline monitoring, the Clean Water Action's or City of San Francisco's studies.

The Clean Water Action's *"Taking Out the Trash: A Source Reduction Pilot Project"* report considered by BASMAA's Trash Committee on June 16, 2011 counted trash on streets and adjacent areas at six different sites in the Bay Area and found that Styrofoam containers and cups represented only 2.9% of all items of trash found. This survey did not include cigarette butts due to the immense quantity.

The City of San Francisco *"Streets Litter Re-Audit, 2208"* reported on results of 84 items of trash found on city streets during 2008 with Styrofoam cups, clamshells, plates and trays representing only 1.13% of all large litter in 2008 and 1.74% in 2007.

The BASMAA initial baseline monitoring events found that Styrofoam food and beverage ware represented 3 and 4 percent of all trash.

Caltrans *"District 7 Litter Management Pilot Study, CT-SW-RT-00-013"* found that Styrofoam was 5% by weight, 15% by volume and 11% by count of all litter including cigarette butts.

Robin Allison in *"From Roads to Rivers" Report 98/6 Cooperative Research Centre for Catchment Hydrology* counted the items in litter captured by SEPTs after a period of 27 days and found styrene pieces and cups to represent only 3.4% of all litter excluding cigarette butts.

The Ocean Conservancy in *"Tracking Trash 25 Years of Action for the Ocean"* did not separately report on Styrofoam collected during the cleanup effort and it may have been included in the categories of cups and lids and cups, plates, forks, knives and spoons.

Public Education and Outreach Program – CR-3

Public education has been a very important component of the Bay Area municipalities storm water program and can become an important element in efforts to achieve compliance with the trash reduction requirements of the MRP. The success of the program should be measured using the protocols adopted by the LA RWQCB for measuring the effectiveness of partial capture devices and institutional controls specified in the *Los Angeles River Watershed Trash TMDL, August 9, 2007 Final Staff Report, pages 31-33.*

It will be interesting to compare the project's baseline monitoring data for Santa Clara County where there has been a very significant public education and outreach effort to baseline data from other areas where the public education effort has been less extensive. It is also possible that the data from the 82 sites in Santa Clara County may understate, not be representative of and distort when combined with the loading data from the other Bay Area counties that have far fewer sites.

Activities to Reduce Trash from Uncovered Loads – CR-4

The Draft Technical Report points out that it is currently illegal to operate a vehicle improperly covered and which its contents escape. This law has been in effect since September 1990 with specific reference to rubbish vehicles added to the State's Motor Vehicle Code in January 2002. This proposed control measure and trash load reduction credits would reward municipalities for taking actions that should have been in effect long ago and should be deleted.

Anti-Littering and Illegal Dumping Enforcement Activities - CR-5

Anti-littering and illegal dumping programs have been implemented long before the initial development of storm water programs in the early 90's and municipalities should not be rewarded with trash reduction credits for enforcement of programs that were instituted over 20 years ago. The use of surveillance cameras and physical barriers at hot spots where the trash would clearly be discharged from the MS4 should receive a credit for the actual measured amount of trash that is prevented from being discharged to the MS4 because this is an enhancement from current practices.

Improved Trash Bins/Container Management – CR-6

Each of the three control measures are amenable to verification using the protocols adopted by the LA RWQCB for measuring the effectiveness of partial capture devices and institutional controls specified in the *Los Angeles River Watershed Trash TMDL, August 9, 2007 Final Staff Report, pages 31-33*. The cleaning practices activities for Business Improvement Districts must be at least as stringent as conducted in New York where reductions (42% of item count basis, 51% of surface area basis and 64% on a weight basis) of "street floatable litter" versus all trash as proposed in the control measure were achieved by adding four manual sweeps to the twice a week mechanical sweeps. The loads for trash also need to be adjusted because the New York data is only for "floatables" and the proposed control measure would provide reduction credits for all trash.

Single-use Food and Beverage Ware Ordinance-CR-7

These control measures would provide for trash load reduction credits for prohibiting distribution of

polystyrene foam food service ware at permittee sponsored events or owned property or prohibit the distribution within the permittees area of jurisdiction with credits as high as 8%.

Studies have been conducted that have quantified the many different items of trash that have been found on street surfaces, in storm water runoff and cleaned up from creeks and shorelines that indicate that the reduction credits proposed by BASMAA are extremely excessive when compared to the levels found in these studies. The reduction credits should never be greater than what is found in the baseline monitoring, the Clean Water Action's or City of San Francisco's studies.

The Clean Water Action's *"Taking Out the Trash: A Source Reduction Pilot Project"* report considered by BASMAA's Trash Committee on June 16, 2011 counted trash on streets and adjacent areas at six different sites in the Bay Area and found that Styrofoam containers and cups represented only 2.9% of all items of trash found. This survey did not include cigarette butts due to the immense quantity.

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The BASMAA initial baseline monitoring events found that recyclable beverage containers represented 4 and 6 percent of all trash and that Styrofoam food and beverage ware represented 3 and 4 percent of all trash.

Caltrans *"District 7 Litter Management Pilot Study, CT-SW-RT-00-013"* found that Styrofoam was 5% by weight, 15% by volume and 11% by count of all litter including cigarette butts.

Robin Allison in *"From Roads to Rivers" Report 98/6 Cooperative Research Centre for Catchment Hydrology* counted the items in litter captured by SEPTs after a period of 27 days and found styrene pieces and cups to represent only 3.4% of all litter excluding cigarette butts.

The Ocean Conservancy in *"Tracking Trash 25 Years of Action for the Ocean"* did not separately report on Styrofoam collected during the cleanup effort and it may have been included in the categories of cups and lids and cups, plates, forks, knives and spoons.

On-land Trash Cleanups-QF-1

This is a control measure where better data collection can produce quantifiable results and it is going to be extremely important that standardized data collection forms be developed and used that will characterize trash by the seven categories in the Sampling Plan. It will also be very important that only trash that can clearly enter and be discharged from a MS4 be counted towards load reductions. This will require an added level of oversight of volunteer efforts if municipalities are to claim and certify the results.

Enhanced Street Sweeping-QF-2

Street sweeping could be one of the better potential source control measure for reducing the discharge of trash from MS4s; however, there are a dearth of studies on the effectiveness of street sweeping practices that address gross pollutant management. Most studies have examined the effectiveness of street sweeping for sediment and associated pollutant removal (*Sediment Management Practices – Clean Watersheds for a Clean Bay Task 4, Literature Review, June 7, 2011*). Only two studies have been

found that specifically address the frequency of street sweeping and removal of gross pollutants. The Caltrans Litter Management Pilot Study and a study conducted in Australia by Nilson. The Caltrans study found increasing the frequency of street sweeping from monthly to weekly did not statistically reduce the count or weight of litter. The results of Nilson's study reported by *Walker and Wong, Effectiveness of Street Sweeping for Stormwater Pollution Control, December 1999* found that there is little correlation between frequency of sweeping, rainfall or wind-run with gross pollutant collected in catch baskets; and, significant amounts of gross pollutants were mobilized into the stormwater system from the street during bursts of rain, wind or both, irrespective of the nature of the street program implemented. Walker and Wong concluded:

- "Current street sweeping practices are found to be not only ineffective for the reduction of fine sediments and sediment-bound contaminants, but also larger gross pollutants capable of entering the stormwater system."
- Street sweeping should be therefore accompanied by structural pollutant treatment measure to effectively reduce the discharge of gross and sediment associated pollutants.
- Significant amounts of gross pollutants are mobilized into the stormwater system during bursts of rain, wind or both.
- There is little correlation between the frequency of sweeping and the transport of gross pollutants into the stormwater system."

The estimated decrease in trash loadings from enhanced street sweeping relies heavily on a report by Neil Armiatge and presentation by Joe Teresi at a CASQAA conference. Figure QF-2.1 was adapted from work done by Neil Armitage in South Africa and indicates that an increase in the frequency of street sweeping can achieve a near 100% effectiveness. Several papers written by Armitage with coauthors clarify the basis of that assumption:

- The plot is "the ***maximum expected*** litter removal efficiency using street sweeping" Armitage, The removal of urban litter from stormwater drainage systems, 2001
- The plot "makes the assumptions that street sweeping is able to remove all the litter off the road, that the significant rainfall events are large enough to mobilize all the litter remaining on the road; and that catch-pits have large enough openings to accommodate the largest pieces of litter. In reality, some litter will be inaccessible (e.g. 'hidden' under motor vehicles), few rainfall events are large enough to carry every piece of litter to the catch-pits, and the litter frequently accumulates at the catch-pits without falling into them even if the opening is nominally large enough. It is easy to overestimate the efficiency of street sweeping. Since street sweeping is a relatively expensive operation, to be cost-effective it needs to be limited to areas where the litter loadings are particularly high, generally the commercial districts. It is also important to ensure that the litter is not being swept into catch-pits rather than being picked up and carted away." requiring supervision of the laborers. *Maris and Armitage, The measurement and reduction of urban litter entering stormwater drainage systems: paper 2 – Strategies for reducing the litter in the stormwater drainage systems, October 2004*
- The street sweeping practices consist of manual sweeping two or three times a day on weekdays in the morning and again in the afternoon. Litter is swept by hand (push brooms) into bags and removed by vehicle. In high litter areas (for example in the vicinity of restaurants and night clubs), the streets are swept mechanically late at night/very early in the morning after most people have gone home. *Marais, Armitage and Wise, The measurement and reduction of urban litter entering stormwater drainage system; Paper 1 – Quantifying the problem using the City of Cape Town as a case study, October 2004.*

Armitage (personal communication December 2012) confirmed that the curve "merely delineates the upper long-term theoretical limit" and that he has not validated the curve through actual field tests.

Claire McKinnon, Manager: Area Cleaning, Solid Waste Management, City of Cape Town (personal communication December 2012) advised that the city's sweeping program is constrained by limited resources and they are short staffed, but work the following schedule:

- Business areas are swept and litter picked up on a daily basis seven days a week with some areas having dedicated staff that move up and down them continually and cover them a number of times each day. There is also a night shift in busy areas because clubs and restaurants stay open until the early hours of the morning.
- In areas of mix business and residential they clean 5 or 6 days a week depending on need.
- Residential areas have a huge variation with some areas receive an ad hoc service based on need while poorer areas are cleaned 5 days a week.
- Manual laborers perform boundary cleaning and empty litter bins, pick up litter, sweep road kerbs and remove light illegal dumping.

It seems fairly obvious that the "sweeping" program in South Africa is not a model that can be followed in the United States and it is disingenuous and misleading to suggest that these efficiencies can be achieved through mechanical street sweeping practices.

The second element to achieve the proposed control measure effectiveness is enforcement of parking restrictions. Palo Alto's September 2008 presentation to CASQA is a very good summary of its No Parking Project. The presentation indicates that approximately 350-cubic yards of additional debris were being collected annually in the 145-acre program area, but doesn't indicate the base amount of debris and what percent increase this represented. I have unsuccessfully attempted to obtain this data from Joe Teresi so that an analysis of the lower cure can be performed.

Rather than using estimated street sweeping effectiveness based on erroneous studies the actual effectiveness of street sweeping can be measured using protocols adopted by the LA RWQCB for measuring the effectiveness of partial capture devices and institutional controls specified in the *Los Angeles River Watershed Trash TMDL, August 9, 2007 Final Staff Report, pages 31-33*. There are additional data needs that need to be addressed before this method can be used and technically valid estimates of street sweeping effectiveness can be determined:

- Protocols for Sampling and Characterization of Street Sweeping Debris Gross Pollutants
  Municipalities have been reporting gross amounts of debris collected by their sweeping programs and protocols are needed for subsampling the debris and characterizing the litter in the seven categories of litter. Ideally this should be done by land use, but may prove too excessive for many municipalities.
- Baseline Street Sweeping and Parking Enforcement Programs
  The current baseline street sweeping programs should be developed for each municipality that intends to use enhanced street sweeping as an approved control measure. This would include such information as type of sweeper, wet and dry season street frequency of sweeping by land use, current parking restrictions and level of enforcement, street miles by land use where there are curbs and no curbs, etc.
- Wet Season Storm Frequency

The frequency of storm events ≥0.20-inch should be developed for each municipality so that municipalities can "tailor" their sweeping programs to their rainfall patterns. The wide differences in rainfall totals and storm intensities found in the Bay Area require this level of refinement.

- Snow Plow Effect
  Caltrans and the *Santa Monica Bay Area Municipal Storm Water/Urban Runoff Project – Evaluation of Catchbasin Retrofits, September 24, 1998* have reported on the "snow plow" effect of sweeping gross pollutants into storm drain inlets when using sweepers equipped with gutter brooms. Lippner (personal communication) advised that the Litter Management Pilot Study documented through photography and sampling the "snow plow" effect; however, was unable to report this because Caltrans was in the process of purchasing numerous sweepers. The "snow plow" effect could materially affect the effectiveness of sweeping programs and this needs to be investigated and if validated measures taken to address the issue – cleaning of storm drain inlets immediately after sweeping unless equipped with catch basin inserts or downstream large capacity full capture devices , modification of sweepers or new technology, etc.

Partial-Capture Treatment Devices- QF-3

A more thorough technical analysis of the City of Los Angeles June 2006 report identified some major concerns with the control measure's recommended 84% effectiveness rating for curb inlet screens that were purchased and installed by Practical Technology, Inc. This certainly points out the importance of doing a thorough review of studies and going beyond just the executive summaries:

- ***"Trash"*** used in the study included sediment, debris, vegetation and litter.
- The efficiencies were determined using historical data ***"trash"*** loading data and current data of "***trash***" collected in catch basins and only "***floatables"*** in the CDS unit – the study did not measure sediment, debris, vegetation and non floating litter in the CDS unit. A similar protocol used by the City to determine the effectiveness of horizontal and vertical outlet catch basins screens found the effectiveness of these devices to be less than 50%.
- The effectiveness of the screens during wet weather (even with the above concern) measured 58-79% and the higher year-round 86% effectiveness was determined by including the assumption that the screens were 100% effective during dry weather.

The City's report included the following observations:

- This type of opening screen cover tended to snare bottles, beverage cups, and other large material as the cover receded to the closed position. Thus resulting in the CB opening screen remaining in the unlocked position.
- This type of opening screen cover relies on static pressure from the accumulation of flow outside the catch basin resulting in some occasions in localized ponding.
- This type of opening screen cover was installed flush with the curb and was prone to damage by vehicles that have large lug nuts, such as buses and heavy duty trucks.
- The placement of this type of opening screen cover flush with the curb face allowed for it to sometimes open when street sweepers swept the streets, resulting in trash being pushed into the catch basins.

Photos taken of the Westlake Area curb inlet screens found significant operability issues with screens stuck open with trash and trash remaining in streets that hadn't been swept creating an environment

for breeding rats, cockroaches, flies and other vermin as well as contributing to the “broken window effect”.

The effectiveness of curb inlet screens needs to be adjusted significantly downward based on a reanalysis of the pilot study conducted by the City or the effectiveness determined by the actual amount of trash measured using the protocols adopted by the LA RWQCB for measuring the effectiveness of partial capture devices and institutional controls specified in the Los Angeles River Watershed Trash TMDL.

Blocked Curb Inlet Screen Leaving Trash in Street Contributes to “Broken Window Theory” and Neighborhood Deterioration

Blocked Open Curb Inlet Screen With Trash Creating Creates Odor Nuisance and Environment for Breeding Breeding Rats, Cockroaches, Flies

Municipalities must use caution in sitting curb inlet screens because of potential for flooding when the screens become clogged. The City of Glendale in its annual storm water program report indicated that it has removed several of the screens because of flooding problems. This past year a lawsuit was filed in a southern California town by a condominium homeowners association against a city and supplier of curb inlet screens because of flood damage. In addition to this concern municipalities in their cost/benefit analysis should include the cost of additional street sweeping to remove trash that has been left in the street.

The use of litter booms/curtins placed in waters of the United States must be removed as control measures because these devices would only apply after the discharge of trash from the MS4 has occurred in violation of the MRP’s water quality standards and discharge prohibitions and after damage to beneficial water uses have occurred. The placement of these devices in waters of the United States would be illegal under 40CFR Section 131.10 which states that “In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.”

The actual removal of trash from pump station trash rack enhancements is amenable to quantification by measuring the additional material removed. The draft Trash Load Reduction Tracking Method, November 11, 20111 refers to studies conducted to date; however, I could not find any reference to these studies in the May 2011 Technical Memorandum #1. An arbitrary 25% default effectiveness for trash rack enhancements must not be included unless applicable studies have been conducted that verify the 25% .

Enhanced Storm Drain Inlet Maintenance-QF-4

Remarkably few studies have been conducted to determine the effectiveness of storm drain inlets to intercept and capture trash in storm water runoff and to determine whether increasing the frequency of cleanout of inlets will improve the capture of trash. *Caltrans, Drain Inlet Cleaning Efficacy Study, CTSW-Rt-03-057.36.1, June 2003* found that "Based on litter data collected during the 2000-2001 DICE monitoring season, no obvious trends can be seen when data from the cleaned and uncleaned catchments are compared." and that "The statistical data further supports the observation that there is no quantitative difference in litter discharged from cleaned and uncleaned inlets." Caltrans further concluded that "For watersheds with adopted trash TMDLs, focus compliance efforts on BMPs other than drain inlet cleaning. As drain inlet cleaning does not appear to be effective in achieving a high percentage reduction in litter, it is likely to be more cost-effective to focus on litter reduction BMPs and structural controls to meet the TMDL requirements."

Most inlets in the Bay Area are constructed to be "self cleaning" without catch basin sumps. These drop inlets effectively pass water and gross pollutants (sediment, vegetation and trash) through to the outlet pipe to the storm drain system, *EOA, Inc. and Geosyntec Consultants, Sediment Management Practices, June 7, 2011*. The discussion of the *Mineart and Singh study in "Sediment Management Practices, June 7,2011* refer to measurement of the volume and mass of sediment and *only* the qualitative (presence) observation of trash and leaves - Figure 3-1 in *"Trash Load Reduction Tracking Method, Technical Memorandum #1- Literature Review"* refers to mass of sediment yet the control measure discussion refers to *volume* of trash and other materials when referring to increases in removals from baseline *"volumes".*

Various storm water runoff monitoring programs characterize gross pollutants (trash, sediment and vegetation) including the Los Angeles baseline monitoring program, Caltrans litter management and BMP studies and in Australia have found a wide variation in the characteristics of gross pollutants, but are in the following ranges:

- Mass of gross pollutants - 25% sediment, 20% litter and 55% vegetation
- Densities - litter ~ 8-24 lbs/ft^3, vegetation ~ 28-40 lbs/ft^3, sediment ~ 120 lbs/ft^3
- Floatable Litter/Total Litter ~80%

It is simply not valid to assume that litter behaves the same as sediment in storm water runoff. To equate ***volume*** of trash to ***mass*** of sediments in storm water runoff and to estimate increases above baseline loadings from increased storm drain inlet cleaning is extremely misleading at best.

This control measure must also include a parking enforcement element. Inlet cleaning and cleaning of inlets with catch basin inserts will probably not be performed at the same time or frequency as street sweeping so signage or parking control requirements will likely be different. The consequences of the inability to clean inlets because of limited access to inlets will be more significant than limiting street sweeping of curbs because of parked cars. Unlike street sweeping where sweepers can go around illegally parked vehicles and leave small areas unswept, missing the cleanout of inlets because of limited access from illegally parked vehicles will leave areas of 1-3 acres that are effectively untreated. Use of signage for inlet cleaning particularly when the cleaning is in response to flooding incidents would not be effective. Rainfall events will determine when storm drain inlets are cleaned rather than fixed schedules used for street sweeping.

Full-Capture Treatment Devices-QF-5

The use of an "***effective***" full capture device is the best method of demonstrating reductions in trash loadings provided the device is truly "***effective***" in "***capturing and retaining***"all (100%) trash >5-mm. Unfortunately few of the 27 devices listed in Table QF-5.1 have undergone a rigorous or as a matter of fact any independent third party testing to determine whether they can achieve the MRP full capture criteria.

BASMAA is doing a **HUGE** disservice to Bay Area municipalities by not performing a detailed technical analysis of the effectiveness, maintenance requirements and life cycle costs of the devices listed in Table QF-5.1. BASMAA is failing to support its members if it simply accepts those devices recognized by the San Francisco Bay Regional Water Quality Control Board as full capture devices. Municipalities must be aware that that they are responsible for compliance with the NPDES Permit requirements and use of a certified device does not invalidate that responsibility. Municipalities that install many of these devices will eventually be faced with the reality that they have not complied with the MRPs prohibitions and water quality standards requirements and then must install additional BMPs under the iterative process applied to NPDES Permits.

An extremely important consideration in the selection of full capture devices will be the maintenance costs and procedures. Observations of the catch basin inserts (horizontal and vertical outlet screens) in Los Angeles have found that trash capture systems and particularly those that rely on direct screening are vulnerable to clogging by "scumutzdecke" and gross pollutants, blockage and bypassing and will require frequent and extremely high level of maintenance. Cleaning of catch basin insert screens may require use of wire brushes, power washing and even steam cleaning to remove "scumutzdecke" and restore the design hydraulic capacity. 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 removal of the connector pipe screens on catch basin inserts to gain access to the connector pipe immediately downstream from the catch basin and will likely require the installation of plugs ("pigs") in storm drains during cleanout operations to prevent the discharge of wash water.

"Scumutzdecke" Blocking Vertical Screen of Catch Basin Insert Bypassing Trash

"Scumutzdecke" Blocking Vertical Screen of Catch Basin Insert Bypassing Trash

I understand that the devices listed in Table QF-5.1 were certified as full capture devices by Dale Bowyer (a fourth level member of the RWQCB staff) at the time the Estuary Partnership staff was seeking BMPs for effectiveness evaluation using funding under the federal stimulus grant. It is not clear what operational or performance criteria were used in evaluating the ability of the 27 devices to achieve the

full captured definition contained in the MRP, but one criterion that has been cited is whether the device had been certified as a full capture devices by the LA RWQB Executive Officer.

The Los Angeles RWQCB in the September 19, 2001 Los Angeles River Trash TMDL specifically delegated to its Executive officer the authority to issue certifications subject to his making the following findings:

- The device or system 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 screen module.

The RWQCB also required that the full capture devices be adequately sized, maintained and maintenance records be available for inspection by the Regional Board.

The Los Angeles RWQCB in the March 4, 2004 Ballona Creek Trash TMDL modified the criterion to specify that the rational formula is to be used in calculating the peak flow using LACDPW isohyetal maps and added the following requirements:

- End of Pipe Configuration – Certain BMPs, which can create a pressure drop, must have an end-of-pipe configuration and not rely on diversion weirs.
- Adequate Pipe Sizing – The pipes carrying the flows from the subdrainage area should be able to handle peak flows.
- Regular Inspections and Maintenance – The full capture system must be regularly inspected and serviced to continuously maintain adequate flow through capacity.

It is not clear that the requirement that the device be designed to prevent plugging of the screening module was carried forward in the Ballona Creek or subsequent Los Angeles River trash TMDLs; however, recently the RWQCB Executive Officer has required extensive monitoring reporting requirements specifying inspection frequencies, cleanout requirements and reporting of installation locations, types of installations, maintenance responsibilities and frequency.

I have a number of questions on whether the devices that Dale has certified can meet the definition of a full capture device and further whether the monitoring program developed by BASMAA for the Estuary Partnership project will determine whether that definition will be met:

- A review of the design of some of the devices indicates they have minimal flow capacity, have minimal capacity to store trash, vegetation and sediment that will be in storm water runoff; that they will bypass and scour accumulated trash during higher than design flows because gross pollutants are stored in an “online’ mode rather than “offline”; and they have surface openings that allow direct bypass of trash due to direct disposal, the street sweeping “snowplow effect” and/or during high gutter flows.
- One catch basin insert vendor reported that its device had a hydraulic capacity in excess of 26-cfs or almost one cubic meter per second when the device itself was smaller than one cubic meter.
- Very few have undergone third party independent testing to evaluate effectiveness
- Devices certified by the LA RWQCB Executive Officer have failed to achieve the full capture definition including horizontal inlet screens, vertical connector pipe screens, Caltrans (storm flow screens) due to erroneous testing data submitted by municipalities, field observations and subsequent third party testing.
- BASMAA’s monitoring program for the Estuary Partnership Project does not determine the amount of trash bypassed from the devices and municipalities may not be submitting reports to even determine whether bypassing is occurring

Finally BASMAA and the Bay Area municipalities must not rely simply on a Regional Board staff member certification of full capture devices. A fundamental principle of the California Water Code is that the Regional Board and not the staff make the determination of violation (compliance) with waste discharge requirements. BASMAA must request that the RWQCB itself make the determination or request that it delegate to its Executive Officer the responsibility of making the certification following specific criteria.

The Regional Board Executive Officer in an August 5, 2004 letter to BASMAA Managers addressed whether storm drain inlet filters achieve the MEP standard and made a number of findings that would apply to the type of inlet filters that have now been certified by the Regional Board staff. The letter was issued after several years where the Regional Board staff required the use of storm drain inlet filters in water quality certifications and recommended their use when reviewing environmental documents for development projects. You are urged to distribute the August 2004 letter to Bay Area municipalities because there is an important lesson to be learned regarding Regional Board staff involvement in selecting waste treatment devices. History does than a tendency to repeat itself.

Creek/Channel/Shoreline Cleanups-QF-6

Creek, channel or shoreline cleanups must be removed as control measures because these activities would only apply after the discharge of trash from the MS4 has occurred in violation of the MRP's water quality standards and discharge prohibitions and after damage to beneficial water uses have occurred. These control measures would be illegal under 40CFR Section 131.10 which states that "In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States." The Los Angeles RWQCB has addressed this issue in the storm water NPDES permits with a finding under federal, State and Regional Regulations "40CFR 131.10(a) prohibits states from designating waste transport or waste assimilation as a use for any water of the U.S. Authorizing the construction of a storm water/urban runoff treatment faculty in a jurisdictional water body would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction and operation of pollution control facility in a water body can impact the physical, chemical, and biological integrity as well as the beneficial use of the water body. Therefore, storm water treatment and/or mitigation in accordance with SUSMPS and any other requirements of this order must occur prior to the discharge of storm water into a water of the U.S."

These cleanup activities may be considered as mitigation for violations of the MRP during an interim period until the 100% reduction in trash loads has been achieved provided they are specifically conducted pursuant to Section 13304 of the California Water Code and in areas where cleanup activities would not result in further environmental damage to endangered and threatened species.

THE MISSING CONTROL MEASURE - Control of Trash from Private Property

One of the most promising trash control measures missing from BASMAA's submittal is a strategy for addressing the discharge of trash from private property and schools. High density residential developments, schools, sport complexes, business parks, big box stores, fast food drive throughs, shopping malls, large business campuses, etc have extensive drainage systems with multiple storm drain inlets and storm drainage systems that discharge into MS4s. An inspection of these land uses found many storm drain inlets often significantly exceeding the number of inlets in the adjacent public streets. The discharge of storm water from these land uses unless treated by large capacity full capture

treatment devices installed on the MS4 downstream of the development would not be treated and a potential source of uncontrolled trash discharged by the MS4.

Using Google Earth - Street View and the coordinates of the BASMAA Monitoring Sites it appears that monitoring would take place at storm drain inlets on the storm drain system on public property adjacent to the land uses rather than directly on the different land uses. The monitoring results would reflect trash loadings from pass through traffic and not of the actual land use. This will not provide trash loadings representative of the land use and will likely significantly understate the individual land use trash loadings.

I would be happy to discuss any questions you have about my comments or can furnish the references I have cited.

Sincerely,

Roger B. James
Senior Consultant