STATE OF CALIFORNIA
CALIFONIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGIONAL BOARD MEETING ON FEBRUARY 10, 2005

Prepared on January 9, 2005

ITEM: 5

SUBJECT: Waste Plastics in the Watersheds and the Open Ocean – Information and Videotape

SUMMARY

At the two most recent Regional Board meetings, the respective agendas contained discussion items focused on important water quality issues that do not regularly appear before the Board. Coincidentally, at the late October Water Quality Coordinating Committee meeting in Ontario, Board Members discussed a need for Regional Boards to discuss longer range water quality policy, priorities, and planning, rather than devoting all Board meeting time to immediate issues, such as permitting. We will have a recurring agenda item to provide that forum, allowing the Board an opportunity for discussion of big picture topics, and as a part of Regional Board meeting agendas, with varying topics (every other meeting).

At the October meeting, Mr. Owen Dell initiated discussion on permeable concrete and low impact development issues. Following on the information-and-discussion item theme from October, in December, Regional Board staff presented a list covering emerging priority water quality issues, which will be addressed in more detail at the March Regional Board meeting. The consensus of the Board was to focus on three issues that are intertwined:

- Riparian Buffer Zones
- Low Impact Development
- Innovative Stormwater Management

Some of the problems we discussed in our December staff report, is a consequence of increased runoff. Plastics from litter and trash are frequently transported to surface waters by runoff. For the February meeting, we will look closer at waste plastics and their impact on watershed systems and the open ocean. The videotape, *Synthetic Seas – Plastics in the Open Ocean*, prepared by the Algalita Marine Research Foundation in Long Beach, serves as the cornerstone for this discussion. The videotape identifies multiple threats posed to marine life by waste plastics. While the videotape focuses exclusively on marine life, waste plastics likely pose the same threat, as they break down, to terrestrial aquatic wildlife (birds and fish) and the respective food chain. This item briefly addresses some of the impacts associated with the breakdown of waste plastics in fresh and salt water biologic systems.

DISCUSSION

This item represents the latest installment in an ongoing series of water quality issues brought before the Regional Board as information and discussion items.

Although the focus of this item is on waste plastics or trash, this issue is linked to the previous discussion on impervious surfaces, as they play a part in transmitting trash into surface water bodies. Hardscape urban surfaces efficiently transfer storm water, combined with the associated pollutant load, in this case trash, through conveyance systems, directly to surface water. Because of the near total runoff and relative efficiency of storm water conveyance, the creek flow tends to be "flashier". As such, low impact development reduces trash transport to surface water bodies.

These flashier creek flows are more effective carriers of pathogens and trash (including plastics)

to the ocean. Waste plastics cause more significant problems than simply aesthetics issues. Plastic does not biodegrade, but rather breaks down to smaller and smaller particle sizes. As the plastic breaks down into smaller bits, often called nurdles, the plastic bits are mistaken by marine life for zooplankton and are ingested into the food chain. Tan nurdles are selectively eaten by aquatic animals and birds because they tend to more closely mimic planktonic food sources than other colored plastic bits, and are correspondingly ingested more by marine animals.

This uptake by smaller organisms is problematic on several levels. First, the plastic bits displace food and nutrition the marine organism normally would have received through the consumption of plankton. Additionally, organic compounds, such as PCBs, preferentially co-solve or adsorb to these plastic bits, are consumed by marine animals, and concentrated in the food chain. Synthetic compounds like PCBs are up to one million times more concentrated in the plastic bits than in the surrounding seawater. Bioaccumulation of PCB-like compounds can act as endocrine disrupters and cause reproductive problems.

Mid-Pacific seawater trawl sampling revealed six pounds of plastic for every pound of plankton. Similar sampling of southern California coastal waters found two and a half pounds of plastic for each pound of plankton. While these large volumes of plastic waste are discharged to the oceans, terrestrial aquatic organisms are also likely ingesting plastics and thereby bioaccumulating synthetic compounds into the food chain as well.

The Los Angeles Regional Board has attempted to deal with the problem through the development of a TMDL for trash in the urbanized watersheds of the region. We think it makes more sense for our region to focus our efforts on tangible activities to reduce runoff, that carries trash, and to encourage on-going efforts to reduce littering (e.g., through stormwater management plans).

CONCLUSION

Regional Board staff will continue with this series of informational items at the March meeting with more detail and discussion of the priorities listed in the December 2004 agenda item. We purpose to provide status reports at every other Board meeting showing in tavular form, how we are doing with advancing the three priority areas of riparian buffer zones, low impact development, and innovative stormwater management.

VIDEOTAPE

Synthetic Seas – Plastics in the Open Ocean, prepared by the Algalita Marine Research Foundation

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