COASTAL WATER QUALITY AND URBAN RUNOFF IN ORANGE COUNTY

SUMMARY

Despite a history of federal and state legislation enacted to eliminate nonpoint source ocean pollution (runoff in storm drains), little progress has been made in improving ocean quality. Contamination is primarily caused by materials that are swept by rainwater into stormdrains. The contaminants include trash, household and yard products, chemicals, animal waste and oil from automobiles. The most effective solution would be to educate and gain the cooperation of the public to eliminate the human sources of coastal pollution. The Grand Jury found:

- Efforts of Orange County agencies to solve the problem are fragmented.
- The public is inadequately informed about sources of ocean pollution and means of prevention.

The Grand Jury recommends more effective coordination among county agencies that work with ocean management policies. Orange County needs new and aggressive methods of educating the public about ocean water quality and ways to minimize polluted runoff.

INTRODUCTION AND PURPOSE

Nonpoint source pollution is runoff caused by materials that wash off city streets, suburban lawns, and agricultural land, and flow through storm drains into the ocean. This pollution is difficult to trace to any one source, increasing the complexity of control. Runoff creates contamination, which creates a health risk for swimmers and surfers, makes fish unsafe to eat, kills sea life and compromises the coastal tourist industry by forcing beach closures.

Interviews with officials working under the auspices of county and private agencies confirmed that there is little public awareness of individual practices that would significantly improve the quality of Orange County rivers and coastal waters.

The Grand Jury investigated: (1) methods used to reduce nonpoint source pollution in county waterways, and (2) approaches that might broaden public awareness of the

problem and promote an investment by the public in controlling the impairment of county waters.

METHOD OF STUDY

The Grand Jury met with representatives of coastal cities and environmental groups and county agencies concerned with coastal water quality. Water and sanitation district officials conducted tours of flood control channels, wetlands, and beaches. The Grand Jury reviewed federal, and state and local legislation that impacts county programs for regulation and enforcement of water quality standards. Reports from various conferences on ocean pollution were examined for relevance to county waters. Newspaper and magazine articles and Internet documents were also reviewed.

BACKGROUND

Federal and state legislation sets standards for the quality of water in Orange County. The Federal Water Pollution Control Act of 1972 (Clean Water Act) was intended to abate pollution and provide financial assistance for wastewater treatment facilities. The thrust of the bill was to regulate point sources (readily identifiable sources). It minimally addressed nonpoint sources (debris from streets, yards and household products, hydrocarbon wastes, untreated sewage from pets, fertilizers and any other substance on city streets and sidewalks). In 1987 the act was reauthorized with additional provisions, including a requirement that the states develop and implement programs to control nonpoint sources of pollution (urban runoff). However, states have not comprehensively addressed nonpoint pollution problems, and the Environmental Protection Agency has been criticized for focusing the bulk of its resources on point source control activities with nonpoint pollution a low priority.

The California Coastal Act was enacted by the State Legislature in 1976. It created a partnership between the state and the coastal counties and cities for planning and regulating coastal resources. The California Coastal Commission has permit jurisdiction over development proposed on the immediate shoreline and in the inland areas within its permit authority. The Commission (in cooperation with state water quality control agencies) is charged with implementation of a strategy to reduce nonpoint pollution. Commission accomplishments include providing a check on environmentally unsound development and stimulating public participation in reducing ocean pollution. However, lack of staff and budget make it impossible for the Commission to mount the type of aggressive campaign that is essential to educate the public so that local solutions to coastal pollution are found.

The Water Quality Act amendments of 1987 followed, requiring states to develop and implement programs to control nonpoint source pollution. The Coastal Zone Act Reauthorization Amendments of 1990 introduced a more aggressive approach to pollution control. The California “Right to Know Bill” of 1997 requires monitoring of beaches and a hotline to let beach-goers know which beaches are polluted. Federal

agencies issued a Clean Water Initiative in 1998 that focused on runoff from animal waste.

As a result of a January, 1999, agreement between the Environmental Protection Agency and the Natural Resources Defense Council (representing Heal The Bay and Santa Monica Bay Keeper), deadlines were set through 2011 for EPA to establish limits on the amount of pollutants allowed to flow into various bodies of water (total maximum daily loads) in Los Angeles County. These limits will also be set in other counties in the state. The federal law that mandated clean waters (the Clean Water Act) called for establishment of these limits 20 years ago. The new agreement presents the formidable challenge of assigning the limits for 750 specific pollutants. Studies are just now taking place (Southern California Coastal Water Research Project) to determine the specific impacts of certain pollutants on the environment.

Over the years several conferences addressing critical ocean issues have been held in California. Experts from academia, environmental groups, business and industry, and government (local, state and federal) tackled coastal environmental issues and suggested approaches for conserving and managing them. Findings consistently agree with the various initiatives in calling for more effective control of polluted runoff through preservation of wetlands, better public education, and more technical assistance to communities.

The limited effect of legislation and of conference recommendations was evident in 1998 (the 25th anniversary of the Clean Water Act) when it was found by the Sierra Club that " …polluted runoff from agricultural fields, animal feedlots, and urban streets, and overflows and leaks from sewage facilities represent major pollution problems still today." Little has changed.

ORANGE COUNTY BEACHES

In 1997 in Orange County there were approximately 225 beach closings/advisories due to poor water quality (sewage spill or elevated bacteria levels) with an additional four indefinite closings. Health risks for swimmers, surfers, scuba divers, snorklers, and windsurfers, are extensive (fever, chills, ear discharge, vomiting, cough with phlegm). Tourism, the sixth largest industry in Orange County, is jeopardized by closed and contaminated beaches. Bio-accumulative chemicals ingested by sealife move up the food chain to humans and threaten human health. Sanitation districts, such as the Orange County Sanitation District, monitor ocean water as well as gathering and analyzing samples of sea life to determine health level.

An epidemiological study of 1996 by the University of Southern California School of Medicine related upper respiratory and gastrointestinal problems in swimmers to flow from runoff. It is a sad reflection on ocean quality that the Surfrider Foundation advises county residents to avoid all ocean water contact for a period of 72 hours after a rain.

TECHNOLOGY

There are products that will remove various constituents of runoff pollution. In the past they have given unsatisfactory performance and have been prohibitively expensive. Recently, devices have been developed that are relatively economical, provide long term reliability, and require minimal maintenance. An example is a storm water interceptor that fits into a new or existing storm sewer where it removes sediments and oil from runoff by diverting sediments to the bottom of the tank and trapping petroleum products at the top. Removal of both substances by vacuum truck is simple and fast. Other products successfully kill bacteria. The most effective method for reducing pollution level close to the source is in utilization of both types of units. Such devices installed at sites of the greatest amount of polluted runoff would significantly reduce the ocean contamination level in Orange County.

The technology is available for removing trash from the flood control channels. A debris boom traps objects in a net-like structure. Trash racks divert debris and brush by picking up the material and rotating it over the top of the machine to the shore where it can be collected at a later time. Both should be used more widely in the county.

Even with ideal public cooperation there will always be some polluted runoff. Emerging technologies are providing methods for preventing polluting materials from entering the ocean. Many such devices are now in the trial and error stage of development.

WETLANDS

Wetlands (marshes/swamps) help prevent nonpoint pollution by intercepting runoff and filtering pollutants before they reach the ocean. They act as sponges, storing excess runoff and slowly releasing it to streams or ocean. Wetlands are damaged by uncontrolled residential and commercial development, road building, oil and gas drilling, and gravel mining. About 300,000 acres of wetlands are being destroyed annually in the United States. Half of the original 221 million acres of wetlands in the lower 48 states had been destroyed by 1991 and over 90% of the wetlands in California have been destroyed. Although recent Coastal Commission vigilance has helped to contain the depletion of wetlands in Orange County, there has been a history of wetland loss in the county. Further loss must be prevented

Preservation efforts center around monitoring development that is harmful to wetlands, purchasing wetlands for conservation by environmental groups, restoring endangered wetlands, and creating artificial wetlands. Restoration of damaged wetlands includes restoring vegetation as it removes most of the sediment and nitrates. The Army Corps of Engineers is involved in restoring wetlands that serve as buffer strips along the runoff channels in some parts of the county. The network of constructed wetlands in the Prado Dam area allows part of the flow from the Santa Ana River to be treated by a cost effective nitrate reduction process. Creating new wetlands is an effective accommodation; but it is difficult to find the space in densely populated coastal areas,

and the land is very costly. When a satisfactory reproduction is accomplished, it is unlikely to function as optimally as the original wetland.

On the East Coast some recent efforts to protect wetlands include one city's requirement for state-of-the-art storm water treatment facilities, including artificial wetlands, for all new, large commercial developments. Another converted the large, central lawn of a shopping mall into a wetland to collect drain water.

Despite the admirable management plans in some cities, such as Huntington Beach, development continues to choke out natural wetlands more rapidly than remediation can neutralize the consequences.

SCHOOL PROGRAMS

Schools in Orange County have a comprehensive curriculum in environmental issues. Science topics in grades seven through twelve include conservation, water pollution, and human pollution of shore zones. A sixth grade unit addresses environment and ecosystems. In addition, both public and private organizations sponsor programs to engage youngsters in coastal conservation issues. Resources for educators, such as a video lending library, slide shows, and speakers are provided by the California Coastal Commission. These include:

- *Save Our Seas* (hands-on K through twelve curricular materials on ocean pollution and the marine environment),
- *Children's Poster Art Contest* (K through six students invited to submit ocean related art),
- *Adopt-A-Beach* (school groups work with adult volunteers in cleaning beaches), and
- Internet environmental education materials.

Despite these efforts surveys indicate that when youngsters become adults they tend to forget or disregard pollution abatement practices.

SURVEYS

In a recent study, 95% of Americans thought water pollution came from industry and not from nonpoint runoff (from the National Oceans and Atmospheric Administration). And, in a Santa Monica survey, less than half of those interviewed realized that storm drain wastewater flows to the ocean. Most respondents did not believe that runoff through storm drains is a source of ocean pollution. An Orange County survey (UCI) completed several ago, showed that just more than half of the respondents were aware that storm drain runoff ends up on the ocean.

SOURCES OF POLLUTION

Nearly 75% of pollutants entering ocean waters originate from land activities. This is further complicated by the fact that 80% of the California population lives within thirty miles of the coast.

The “who” that causes nonpoint source ocean pollution is each of “us.” Everyone is part of the problem. The contamination introduced by the average person is generated from

- agricultural runoff
- auto leaks and spills, used oil and antifreeze disposal into storm drains
- landscape and construction debris
- restaurant grease
- lawn clippings
- excess fertilizer on home lawns and golf courses
- animal waste
- highway runoff
- litter
- household cleaners
- paint and paint thinner
- lead from gasoline
- rubber from tires

Informal surveys found that even those who are aware of the connection between these sources of pollution and ocean toxicity were unaware of appropriate methods of discarding harmful materials. Nor were they aware of alternative products that would not create hazardous waste. Few know where county collection centers for deposit of hazardous waste are located and virtually none are aware that there are gas stations (292 in Orange County) that accept discarded motor oil. Surveys show that people in inland cities think that pollutants come from coastal residents; they do not recognize that runoff from all points along a waterway lead to the ocean and contribute to ocean contamination.

In particular, communities with sizeable populations of new immigrants need information. There is a lack of understanding of how materials in the environment end up in the ocean. Experience in native countries may not build such awareness. There is a need for constant reinforcement of the message as new populations move into county communities.

RESOLUTION ISSUES

Allowing the ocean to become polluted and paying to clean it up, as opposed to preventing pollution in the first place, is illogical.

The general public is unaware that items dropped in streets are destructive to marine animals. Six-pack rings and fishing lines entangle animals so that they can neither breathe

nor swim. Birds, fish, and mammals mistake plastic for food and, feeling full, do not eat and die of starvation. Since plastic is not biodegradable, it remains floating on the surface for as long as four hundred years (from *Plastics In Our Ocean*). The styrofoam cups and plastic bags in the water are the result of everyday people's doing everyday things. Those same people must be convinced that their one styrofoam cup tossed in the gutter contributes to pollution in the ocean.

Businesses must be made aware of the economic impact to *them* of polluted waterways. And, since studies show that the vast majority of residents of the county use the beaches, self-interest might be a powerful motivator to individual responsibility. Signs could be placed both on the coast and inland with information and the amount of fines for various types of illegal disposal. Public employees who work in the community should be encouraged to report violations of disposal regulations.

Public education should be intensified. Campaigns need to create an awareness that storm drains lead directly to the ocean with no treatment plant in between; whatever is on the street goes to the coast.

Within Orange County there is a fragmentation of effort on the part of the public and private agencies that are actively concerned with the issue. Partnerships such as the Santa Ana River Watershed Group, the Southern California Coastal Water Research Project Authority, and the working relationship of county and cities are important and productive, but there is enormous duplication of effort consuming limited budgets. Several agencies may explore the same issues at the same time. Cooperation is needed between agencies and organizations within the county, as well as all neighboring counties. Watershed management plans show promise in involving inter-county constituents. The enormous cost of protecting and managing ocean resources mandates interorganizational cohesiveness as all are hampered by a lack of budget and staff, complicated by unfunded mandates from federal and state legislation. And those funds that are available must be rapidly directed toward the resolution of coastal pollution problems before lawsuits force the issue. The lead agency for a county coalition would logically be the Public Facilities and Resources Department. Although clean water is mandated, professionals do not agree on how to implement the legislated standards. Exploration is only now in progress to determine the consequences to marine and human life of each pollutant. Priorities for county ocean cleanup efforts should logically begin with areas that have the highest value to the community.

Los Angeles County is now starting construction of a diversion system which (from April 15 to October 15) will send runoff to sewage treatment systems pollutants will be removed and the treated water will be piped out to sea. The treated water will be cleaned to sanitary sewer standards. For additional diversion systems are scheduled for beach locations that have high pollution. Two Los Angeles County coastal cities have already diverted drains.

The Los Angeles County system will function during the dry season when large numbers of people are on the beaches. It is hoped that the size of sewage treatment plants

can be increased so that a higher volume of runoff may be treated for more months of the year. Costs for the Los Angeles County project were aided by a grant from county Proposition A.

Diversion of storm water to sewer treatment has been initiated on a small scale within Orange County. The larger Los Angeles project should be evaluated for possible replication in Orange County. Representatives of Orange County agencies stated that this procedure would be a dependable way to clean runoff water but indicated concern for the cost. A possible source of funding would be from the county Real Property Tax allocation for exclusive use of Harbors, Beaches, and Parks.

Control of point source pollution relies on enforcement. Control of nonpoint pollution relies on voluntary compliance and this has not been effective. For control to be effective, the public must take an active role in curbing pollution. Agencies responsible for some aspect of enforcement include Fire Departments, Police, Fish and Game, Health Care Agency and, under water quality ordinances, the county and all cities. Enforcement of what businesses are obligated to do according to their permits would substantially diminish pollution.

Despite conflicting budget needs, clearly the impact of the pollution problem on our coastal waters suggests that a substantially larger portion of the income from the special district tax, which is dedicated to exclusive use of Harbors, Beaches, and Parks, should be allocated for preventing ocean pollution. Funds saved from no longer requiring abatement would become available to contribute to the cost of preventing the damage. In addition, if fines that are set by cities were to be raised substantially, income could, and should, feed back to fund public education on the issues. Current fine levels may invite some polluters to continue polluting, as fine costs are less than abatement costs.

In order to prevent drains from becoming congested with trash, debris, and other pollutants, street sweeping should be scheduled a minimum of once a week with vehicles that both sweep and vacuum residue.

Cities have a responsibility to clean catch basins once a year. Each year at the time drains are cleaned, Newport Beach changes the logo which is stenciled on storm drains so that staff can quickly tell whether a stormdrain has been cleaned as scheduled. Ideally, before an expected storm, streets would be swept and catch basins and surrounding curbs and gutters would be cleaned.

The technology to aid in cleanup of runoff in stormdrains is finally at a workable stage, and it is important for the county to monitor developments that are likely to create effective and affordable solutions.

Since some residents do not have transportation to take toxic materials to collection sites, truck routes might be established countywide with frequent stops for collection. Clearly labeled containers could be provided to residents who use the mobile collection service to serve as a reminder of which substances are not to be dumped. The city of Garden Grove provides pickup at homes for used motor oil. Los Angeles County's

"hazardous waste round-up" collection sites are scheduled to average once a week in some parts of the county. The sites change each week, so that all areas of the county are covered.

The issues are complex and the challenges formidable. When dealing with environmental problems, a solution to one may create another. Clearly the cost of a clean ocean is immense, but the benefits are worth it. The enormous strides that have been made in air quality, highway littering, and recycling prove it is possible. Changing public habits is daunting in our "disposable" society. Identifying polluters in order to assign responsibility and levy fines will take ingenuity.

The cost of the solution must be weighed against the value obtained and, as with other major civic projects, where there is a will to have a clean and healthy coastal area, the money will be found. Despite the cost, we cannot afford to ignore the issues of our marine environment, or we will leave a toxic, unusable coastal zone to future generations.

FINDINGS

Under *California Penal Code* Sections 933 and 933.05, responses are required to all findings. The 1998–99 Orange County Grand Jury has arrived at 7 major findings.

1. Historically, nonpoint source pollution received little emphasis and it continues to be a major source of ocean pollution. Many programs addressing ocean pollution have been initiated by agencies and organizations in the county but there is insufficient coordination of effort both within the county and between Orange County and adjacent counties.

A response to Finding 1 is required from the following county offices: **Public Facilities and Resources Department** and the **Orange County Sanitation District**.

2. Although there is agreement that the average citizen is a significant contributor to nonpoint source pollution, not enough has been done to enlist the cooperation of the public in eliminating the sources of the problem. There is also inadequate information reaching the public concerning the correct disposal of pollutants.

A response to Finding 2 is required from: **Public Facilities and Resources Department,** all **City Managers** and the **Orange County Sanitation District**.

3. Responsibility for enforcing nonpoint source abatement laws lies with the offices of the sheriff-coroner, city police, county fire, and city fire departments. Problems in enforcing compliance of nonpoint source pollution abatement laws are exacerbated by the difficulty of identifying the polluter. In addition, once identified, fines are often so minimal that it is more cost effective for the offender to pay the fine than to properly dispose of the pollutants.

A response to Finding 3 is required from the following county agencies: **Orange County Sheriff-Coroner Department**, all **City Police Departments**, **County Fire Department**, all **City Fire Departments**.

4. Technology for stormwater treatment and management is an emerging field. The best of the new systems can be expected to remove pollutants from stormwater, to be cost-effective and to have low maintenance requirements.

The Grand Jury does not require a response to this finding.

5. A percentage share of Orange County district property tax dollars is designated by statute for exclusive use of Harbors, Beaches and Parks.

The Grand Jury does not require a response to this finding.

6. A diversion system in Los Angeles County is in-process and will connect pipes and filters to send runoff to existing sewage treatment systems where toxic substances will be removed before the runoff water enters the ocean.

The Grand Jury does not require a response to this finding.

7. Streets are not being swept and storm drains are not being cleaned at sufficiently frequent intervals.

The Grand Jury does not require a response to this finding.

RECOMMENDATIONS

In accordance with *California Penal Code* Sections 933 and 933.05, each recommendation must be responded to by the government entity to which it is addressed. These responses are submitted to the Presiding Judge of the Superior Court. Based on the findings, the 1998–99 Orange County Grand Jury recommends that:

1. The **Public Facilities and Resources Department** make a strong effort to coordinate the program activities of all public and private agencies and organizations in the county dealing with nonpoint source ocean pollution. (See Finding 1.)

The **Public Facilities and Resources Department** is required to respond to this recommendation.

2. The **Public Facilities and Resources Department** and all **City Managers** make a strong effort to continue and enhance education regarding the correct disposal of materials that result in ocean pollution. Such efforts should include:

   Posting signs in areas of the source of major pollution showing the range of fines for illegal disposal

   Provision for a mobile collection service throughout the county for pick-up of toxic substances

   An information campaign to communities with a large population of immigrants on appropriate methods of discarding materials that create polluted runoff. (See Finding

The **Public Facilities and Resources Department** and all **City Managers** are required to respond to this recommendation.

3. The Public Facilities and Resources Department find creative ways or incentives to identify nonpoint source polluters and address the possibility of increasing fines for violators. (See Finding 3.)

The **Public Facilities and Resources Department** is required to respond to this Recommendation.

4. The Public Facilities and Resources Department aggressively investigate new technology for reducing nonpoint source water pollution. (See Finding 4.)

The **Public Facilities and Resources Department** is required to respond to this Recommendation.

5. A review of the property tax fund designated for Harbors, Beaches, and Parks to determine the proper amount to be assigned to improve ocean quality. (See Finding 5.)

The **Public Facilities and Resources Department** is required to respond to this Recommendation.

6. The Public Facilities and Resources Department evaluate the system in process in Los Angeles County that will divert runoff water to sewage treatment systems for possible replication in Orange County. (See Finding 6.)

The **Public Facilities and Resources Department** is required to respond to this recommendation.

7. Cities and unincorporated areas require street sweeping weekly with both sweep and vacuum equipment. Cities and unincorporated areas mark storm drains so as to readily indicate the last date of cleaning. (See Finding 7.)

All **City Managers** are required to respond to this Recommendation.

APPENDIX

MEETINGS AND TOURS

July 28, 1998. Tour of Orange County Sanitation District

July 29, 1998. Tour of Orange County Water District

August 12, 1998. Meeting with Surfrider Foundation

August 18, 1998. Tour of Taormino Industries Disposal/Recycling

August 19, 1998. Tour of Rainbow Disposal Company

August 24, 1998. Meeting with Santa Margarita Water District

August 31, 1998. Meeting with Orange County Public Facilities and Resources Department, Flood Control

September 14, 1998. Meeting with South Coast Air Quality Management District

October 5, 1998. Tour of Orange County Integrated Waste Management Department, Olinda Alpha Landfill

October 5, 1998. Meeting with Local Agency Formation Commission

October 21, 1998. Tour of Orange County Frank R. Bowerman Landfill

December 7, 1998. Meeting with Orange County Sanitation District

December 14, 1998. Meeting with South Coast Air Quality Management District

January 12, 1999. Meeting with Orange County Public Facilities and Resources Department, Coastal Facilities

January 22, 1999. Meeting with City of Santa Ana Fire Department

January 25, 1999. Tour of Huntington Beach Coastal Area, City of Huntington Beach Public Works Department

January 26, 1999. Meeting with City of Newport Beach, General Services

February 11, 1999. Meeting with Los Angeles County Department of Public Works, Environmental Programs Division

February 17, 1999. Meeting with California Coastal Commission

February 23, 1999. Meeting with Lake Forest Public Works Department

March 8, 1999. Meeting with Orange County Public Facilities and Resources Department, Environmental Resources

March 9,1999. Tour of Prado Dam, Anaheim Catch Basins, Eastside Reservoir

March 25, 1999. Meeting with representative of a water treatment interceptor unit manufacturer

March 29, 1999. Meeting with Army Corps of Engineers

April 8, 1999. Meeting with City of Cypress Environmental Office

May 7–8, 1999. Tour of the California Aqueduct System and Oroville Dam

June 11–13, 1999. Tour of the Colorado River Aqueduct

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BROCHURES

Flyers and brochures from the Integrated Waste Management Department, Los Angeles County, Orange County and Cities, County Sanitation Districts of Orange County, Riverside County Flood Control and Water Conservation District.

NEWSPAPERS

Numerous articles on coastal pollution in county/city newspapers.