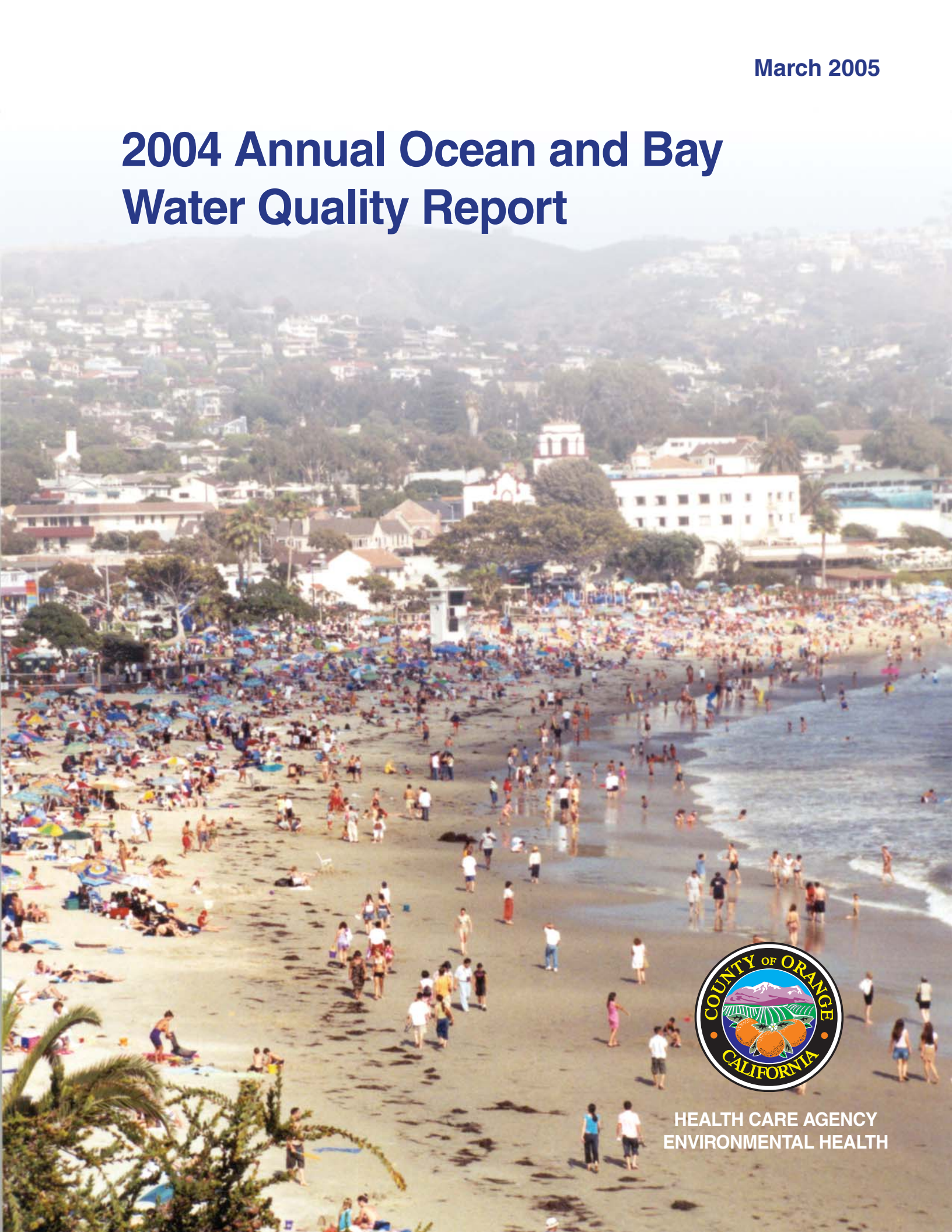
March 2005

2004 Annual Ocean and Bay Water Quality Report



HEALTH CARE AGENCY
ENVIRONMENTAL HEALTH

March 2005

2004 Annual Ocean and Bay Water Quality Report

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- State of California Water Resources Control Board
- Orange County Sanitation District
- South Orange County Wastewater Authority

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The staff of Environmental Health's Ocean Water Protection Program would like to thank the Marine Safety and Lifeguard Divisions of the cities of Seal Beach, Huntington Beach, Newport Beach, Laguna Beach and San Clemente; U.S. Ocean Safety Lifeguards; Monarch Beach Lifeguards; County of Orange Resources and Development Management Department/Harbors, Beaches and Parks staff; and the State Department of Parks and Recreation staff for their continued assistance.

We would also like to thank staff from the Huntington City Beach, Newport Beach and San Clemente City Beach Lifeguards, Orange County Coastkeeper, Irvine Ranch Water District, City of Garden Grove, and County of Orange for providing photographs for this report.

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Unauthorized Discharges of Waste and Ocean and Bay Water Closures 1987 – 2004

Laguna Beach

EXECUTIVE SUMMARY

The *2004 Annual Ocean and Bay Water Quality Report* provides an analysis of bacteriological water quality data for the 112 miles of Orange County's ocean and bay waters for the years 2000 – 2004, and incorporates sewage spill and related ocean and bay water closure data from 1987 – 2004. This fourth annual report also describes year-to-year variability and trends in bacteriological water quality for Orange County's ocean and bay waters.

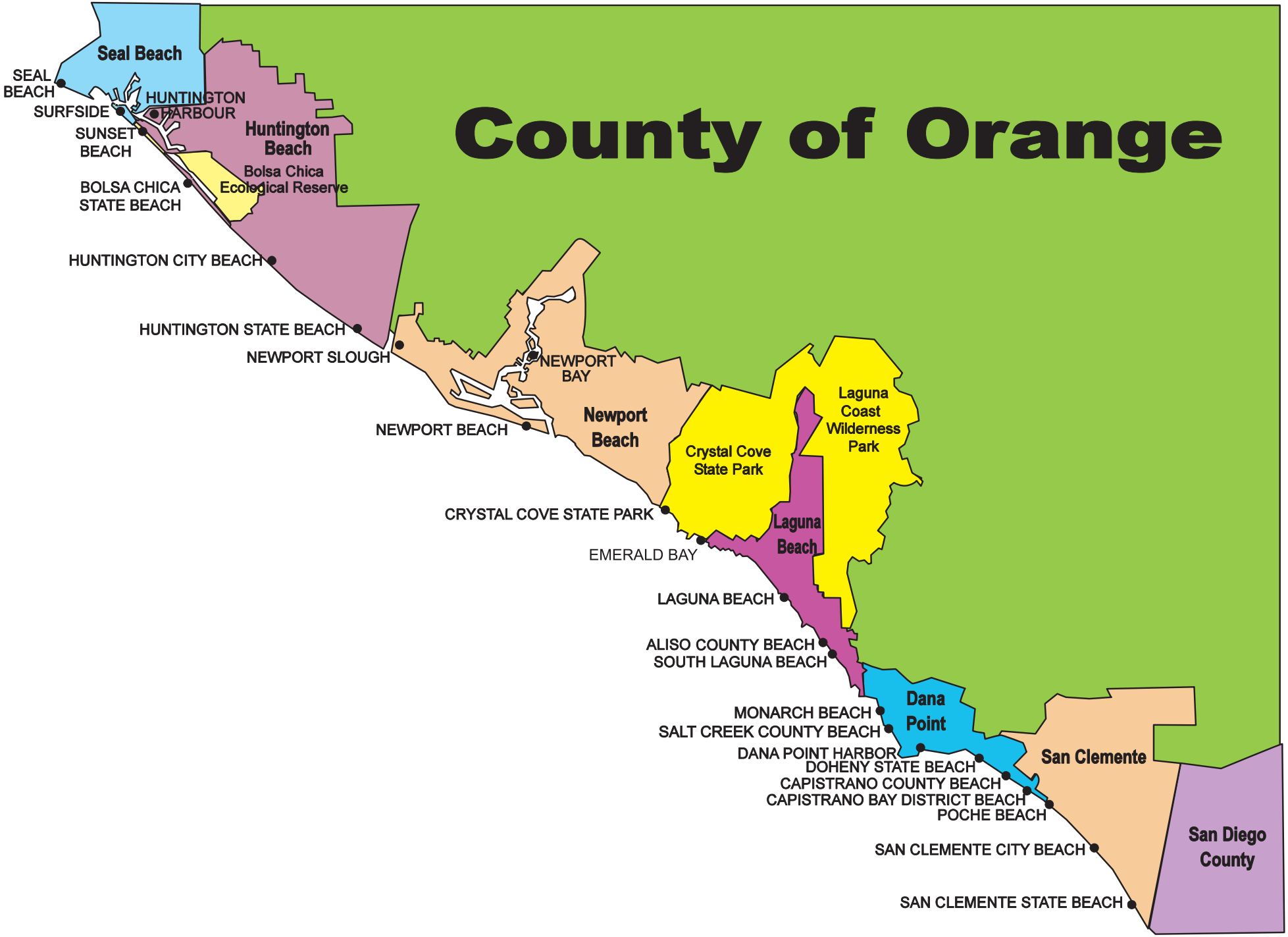
Major findings of the *2004 Annual Ocean and Bay Water Quality Report* are:

Sewage Spills and Closures

- In 2004, the number of sewage spills reported to the Ocean Water Protection Program decreased for the second consecutive year. This represents the first time a consecutive year-to-year decrease has occurred since 1987.
- For the fourth consecutive year, the number of Beach Mile Days of closure due to sewage spills decreased. In 2004, the number of Beach Mile Days of closure was 13.9, which represents the lowest number of Beach Mile Days of closure recorded since 1999 and a 74% reduction in Beach Mile Days of closure from 2000.
- From 2003 – 2004, the percentage of closures caused by sewage spills where the volume of sewage spilled was greater than 1000 gallons, has remained virtually unchanged.
- In 2004, the median volume of sewage spilled per closure was 275 gallons, which represents the lowest median value of sewage spilled per closure since 1999.
- For the second consecutive year, the percentage of closures due to pipeline blockages has decreased while the percentage of harbor and bay closures due to vessel pump station failures has increased. In 2004, 30% of all closures were caused by harbor and bay vessel pump station failures, and the number of harbor and bay closures exceeded the number of open coastal water closures.
- Private property owner sewage spills were responsible for 50% of ocean and bay water closures in 2004.

Postings

- For the third consecutive year, the number of Beach Mile Days posted during the AB 411 period (April - October) decreased. The number of Beach Mile Days posted due to AB 411 standards violations for 2004 was the lowest recorded for an AB 411 period since 2000.
- For the third consecutive year, the number of Beach Mile Days posted during the calendar year decreased. The number of Beach Mile Days posted due to AB 411 standards violations for 2004 was the lowest recorded for a calendar year.
- Violations of the AB 411 enterococcus single sample standard accounted for 63% of the ocean and bay water postings for 2004. The percentage of enterococcus single sample standard violations has remained virtually unchanged during the period of 2000 – 2004.
- Violations of multiple AB 411 standards accounted for 19% of the ocean and bay water postings during the AB 411 period of 2004. The percentage of violations of multiple AB 411 standards has remained virtually unchanged during the period of 2000 – 2004.
- Doheny State Beach, Capistrano Bay District Beach and Huntington State Beach had the highest cumulative total number of Beach Mile Days posted due to AB 411 standards violations at coastal ocean areas for both the AB 411 period and the calendar year period of 2000 – 2004.
- For calendar year 2004, the number of ocean and bay Beach Miles Days posted due to AB 411 violations represents 1% of the total Beach Mile Days available for recreational water use for the year.


County of Orange
Seal Beach
SEAL BEACH
SURFSIDE
HUNTINGTON HARBOUR
Huntington Beach
SUNSET BEACH
Bolsa Chica Ecological Reserve
BOLSA CHICA STATE BEACH
HUNTINGTON CITY BEACH
HUNTINGTON STATE BEACH
NEWPORT SLOUGH
NEWPORT BAY
Newport Beach
NEWPORT BEACH
Crystal Cove State Park
Laguna Coast Wilderness Park
CRYSTAL COVE STATE PARK
Laguna Beach
EMERALD BAY
LAGUNA BEACH
ALISO COUNTY BEACH
SOUTH LAGUNA BEACH
Dana Point
MONARCH BEACH
SALT CREEK COUNTY BEACH
DANA POINT HARBOR
DOHENY STATE BEACH
CAPISTRANO COUNTY BEACH
CAPISTRANO BAY DISTRICT BEACH
POCHE BEACH
San Clemente
SAN CLEMENTE CITY BEACH
SAN CLEMENTE STATE BEACH
San Diego County

THE OCEAN WATER PROTECTION PROGRAM

As part of the County of Orange Health Care Agency (HCA), Environmental Health's Ocean Water Protection Program is responsible for protecting the public from exposure to ocean and bay waters that may be contaminated with sewage or may cause illness along Orange County's 42 miles of open ocean coastline and 70 miles of harbor and bay frontage. Ocean and bay waters used for body-contact recreational activities such as swimming, surfing and diving must meet specific bacteriological standards to be considered safe for such purposes.

Over the past 40 years, the Health Care Agency and two local sanitation agencies (Orange County Sanitation District and South Orange County Wastewater Authority) have been cooperatively testing the coastal waters in Orange County for bacteria that indicate the possible presence of disease-causing organisms. The sanitation agencies and HCA program staff participate in the weekly collection of water samples at approximately 150 ocean, bay and drainage locations throughout coastal Orange County.

Program staff review the results of bacteriological water samples every day and issue ocean and bay water closures, postings and health advisories under the requirements stipulated by the California Health and Safety Code and Title 17 of the California Code of Regulations. When the results of testing indicate that one or more of the Ocean Water-Contact Sports Standards have been exceeded, the public is notified (i.e., signs are posted at the beach, hotline and Web page are updated), and the sampling frequency and locations may increase until the sample results meet established standards and/or the source of the problem is eliminated. In addition, the Ocean Water Protection Program staff respond on a 24-hour basis to investigate reports of sewage or other contamination incidents affecting Orange County's ocean and bay waters.

The Ocean Water Protection Program staff maintain an Ocean and Bay Water Posting and Closure Hotline and Web Page.

Ocean and Bay Water Closure & Posting Hotline: (714) 433-6400.

The Ocean and Bay Water Closure & Posting Web Page: www.ocbeachinfo.com.

The following is a listing of the reports and data located on the web page in the "Downloads, Reports & Data" section:

- Annual Ocean and Bay Water Quality Reports (2001, 2002, 2003 and 2004);
- Historical bacteriological data (1986 – present); and
- Sewage spill closure logs (1999 – present).

Huntington City Beach

Ocean Water-Contact Sports Standards – Assembly Bill 411

In 1998, Assembly Bill 411 (Wayne) was chaptered into law and added Sections 115880-115915 to the California Health and Safety Code. The law authorized the creation of bacteriological ocean water quality standards that are considered more protective of public health (California Code of Regulations Sections 7956-7962).

The standards are informally called "AB 411 Standards" and include the following:

- Required testing of the waters adjacent to all ocean and bay public beaches for total coliforms, fecal coliforms and enterococci bacteria that may indicate the presence of possible disease-causing bacteria, viruses or protozoa.
- Required maintenance and updates of the Ocean and Bay Posting and Closure Hotline.
- Established single sample standards for total coliforms, fecal coliforms and enterococci bacteria which shall not exceed:
    - Total Coliforms: 10,000 organisms per 100 milliliter sample.
    - Fecal Coliforms: 400 organisms per 100 milliliter sample.
    - Enterococci: 104 organisms per 100 milliliter sample.
    - Fecal:Total ratio: >1,000 total coliforms if ratio exceeds 0.1.
- Established 30-day geometric mean standards (of five weekly samples) for total coliforms, fecal coliforms and enterococci bacteria which shall not exceed:
    - Total Coliforms: 1,000 organisms per 100 milliliter sample.
    - Fecal Coliforms: 200 organisms per 100 milliliter sample.
    - Enterococci: 35 organisms per 100 milliliter sample.
- When any waters adjacent to a public beach fail to meet any of the standards described above, the local health officer shall post the beach with signs to restrict access to the affected waters.
- Weekly testing is required from April 1 to October 31 if the following applies:
    - The beach is visited by more than 50,000 people annually.
    - The beach is located in an area adjacent to a storm drain that flows in the summer.
- In the case of a known release of sewage into ocean or bay waters adjacent to a public beach, the local health officer is required to:
    - Immediately close the affected ocean or bay waters until the source of the sewage is eliminated.
    - Collect bacterial samples from the affected waters.
    - Continue the closure until testing results of water samples meet the established standards.

"Big Corona Beach"
Corona del Mar State Beach, Newport Beach

Disease-Causing Microorganisms

Contaminated runoff and untreated sewage released into recreational waters may result in swimmer exposure to pathogenic bacteria, viruses or protozoa. These disease-causing microorganisms may be present at or near the sites where discharges enter the water.

The following table lists the types of microorganisms and the diseases (or symptoms) they may cause.

PATHOGENIC AGENT	DISEASE
Bacteria	
Escherichia coli (E. coli)	Gastroenteritis
Salmonella (not typhi)	Gastroenteritis, usually with fever; less commonly septicemia (generalized infection - organisms multiply in the bloodstream)
Some strains of *Shigella*	Gastroenteritis, usually with fever
Protozoa (Intestinal Parasites)	
Cryptosporidium	Diarrhea - Cryptosporidiosis
Giardia lamblia	Diarrhea - Giardiasis
Viruses	
Rotavirus	Gastroenteritis
Enteroviruses	Respiratory infection, rash, fever, meningitis
Norwalk and Norwalk-like viruses	Gastroenteritis
Adenovirus	Respiratory infection and gastroenteritis
Hepatitis A (outbreaks associated with eating shellfish from sewage-contaminated water)	Infectious hepatitis (liver malfunction)

The levels of bacteria, viruses and protozoa decrease in recreational waters over time due to the following reasons:

- Die off due to sun (ultraviolet exposure), salt water or age.
- Predation by other organisms.
- Dilution.

Indicator Bacteria Testing Methods

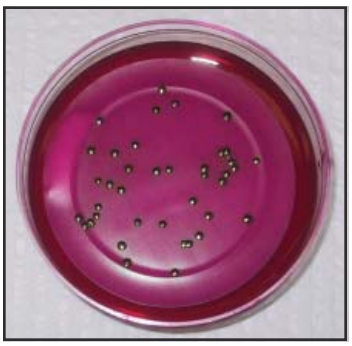
The detection and enumeration of disease-causing organisms (pathogens) identified with waterborne illness is difficult, time-consuming and costly. Thus, most water quality laboratories test for fecal indicator bacteria (i.e., total coliforms, fecal coliforms and enterococci) as a means to ascertain the likelihood that human pathogens may be present in recreational waters. Fecal indicator bacteria normally occur in the intestines of all warm-blooded animals, are excreted in high numbers in feces, but can also be found in soil and decaying vegetation. Since there is no ideal indicator group, water should be tested for more than one indicator. Total coliforms are a broad group of organisms that include fecal coliform bacteria as well as *E. coli*. The enterococci group has been determined to be a good indicator of swimming associated gastroenteritis. The methods most commonly used to detect fecal indicator bacteria in water include:

- Membrane Filtration (MF)
- Multiple-Tube Fermentation (MTF)
- Colilert ®
- Enterolert®

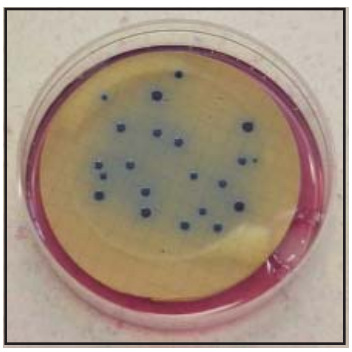
All of the methods are culture based, which means that the indicator bacteria present in water must be allowed to grow in order to be detected. Differences between the methods include how the bacteria are detected and counted, how soon the results become known, and cost. Each method has its advantages and disadvantages. Most of the limitations depend on such factors as the types of other constituents in the water and density of bacteria present, and all require at least an 18-hour incubation period. The following is a brief summary of these methods. Detailed descriptions for these methods are available in the latest edition of *Standard Methods for the Examination of Water and Wastewater*.

Membrane Filtration (MF)

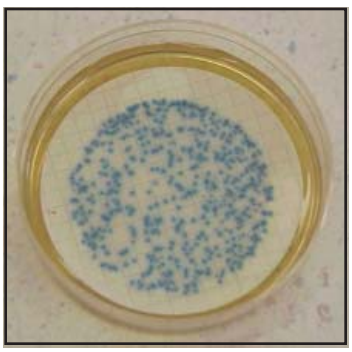
The membrane filtration method involves filtering water through a porous membrane to concentrate or trap bacteria from the water sample on the filter surface. The membrane filter is placed onto a culture medium designed to encourage the growth of the target indicator. The filter is incubated for 22 - 24 hours to allow the bacterial cells to multiply into visible colonies. Theoretically, each bacterial cell (or clump of cells) produces a single colony on the membrane. The colonies are viewed under a 10X magnifying lens and distinguished from non-target bacteria based on the type, size and color of the colonies. Target bacteria are indicated by pigment production resulting from bacterial enzymatic reactions to specific substrates. The number of colonies present in 100 milliliters of water, also known as “colony forming units” (CFU), is counted and the concentration of organisms in the original sample is calculated. The County of Orange Health Care Agency/Public Health Laboratory, the South Orange County Wastewater Authority Laboratory and the Orange County Sanitation District Laboratory use the MF method for the analyses of total coliforms, fecal coliforms and enterococci in ocean and bay waters.



Total Coliform Colonies



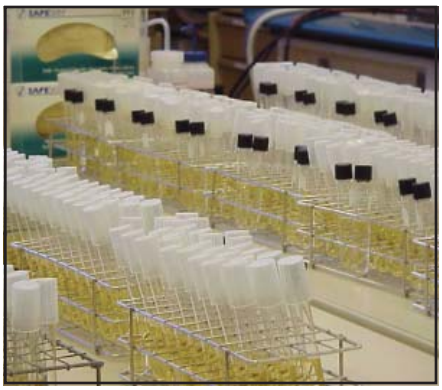
Fecal Coliform Colonies



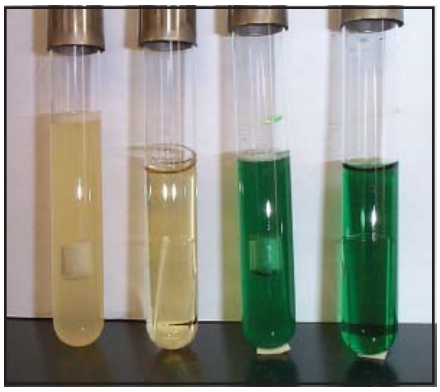
Enterococcus Colonies

Multiple-Tube Fermentation (MTF)

The multiple-tube fermentation technique is based on the ability of coliform bacteria to produce turbidity and gas in specific liquid media after incubation for 24-48 hours. Because there is a presumptive and confirmation step required by this technique, results may take up to 96 hours for completion. Multiple portions of the water sample are pipetted into test tubes containing culture media. Bacterial growth results in turbidity and production of gas. A "Most Probable Number" (MPN) of bacteria value present in 100 milliliters of water is determined based on the combination of tubes that are positive for the confirmatory test. MTF can be used to test for total coliforms, fecal coliforms and *E. coli*.



Multiple-Tube Fermentation Set-Ups



Test Tubes with/without Turbidity and Gas Formation

Colilert®

The Colilert® technique is a defined substrate analysis which detects the production of enzymes specific to total coliform and *E. coli*. Coliform bacteria enzymes break down specific chemical substrates to produce a yellow color. If total coliforms are present, the testing medium turns yellow. If *E. coli* are present, the yellow wells will also fluoresce blue under an ultraviolet light. A statistical estimation of their numbers is determined by using a multi-well tray and is reported as the "Most Probable Number" (MPN) of bacteria present in 100 milliliters of water. Test results are available in either 18 or 24 hours depending on the formulation used.

Total Coliform Colilert® Tray

E. coli Colilert® or Enterolert® Tray

Enterolert®

The Enterolert® technique is another type of defined substrate test that is similar to the Colilert® technique. The test detects the presence of an enzyme produced by enterococcus bacteria. A positive reaction is determined by checking the tray for fluorescence. Results are reported as the "Most Probable Number" (MPN) of bacteria present in 100 milliliters of water and test results are available in 24 hours.

Warning Signs

The yellow closure sign is posted when a sewage spill affects ocean or bay waters adjacent to a public beach. This sign is also available in Spanish.

The warning sign with the red and black border is posted when a violation of the AB 411 Ocean Water-Contact Sports Standards occurs.

The warning sign with the yellow and black border is posted near storm drains, creeks and rivers to advise the public of the risks associated with possible contamination from urban runoff.

Beach Mile Days

The term “Beach Mile Days” is used to represent the measurement of the number of days and the linear area of ocean or bay front waters that are closed due to a sewage spill or posted for a violation of the AB 411 Ocean Water-Contact Sports Standards.

Beach Mile Days (BMDs) are calculated by multiplying the number of days of a closure or posting by the number of miles of beach closed or posted:

(Number of Days)	x	(Miles of beach closed/posted)	=	Beach Mile Days

For example, if a sewage spill resulted in the closure of ½ mile of beach for 7 days then:

(7 days)	x	(0.5 mile)	=	3.5 Beach Mile Days of closure

The total number of available ocean and bay Beach Mile Days for Orange County are:

(365 days)	x	(42 miles coastal)	=	15,330 Available Beach Mile Days
(365 days)	x	(70 miles bays)	=	25,550 Available Beach Mile Days
(365 days)	x	(112 miles total)	=	40,880 Available Beach Mile Days.

Using BMDs is a more meaningful measurement of ocean and bay water impairment than using the number of incidences or the number of days since BMDs take into account both the amount of beach and the length of time of a closure or posting. The State of California Water Resources Control Board and all California coastal counties use BMDs for reporting closures and postings which provides a standardized measure allowing comparison of different areas (beach to beach or county to county) or assessing trends over time.

Crystal Cove State Park

OCEAN AND BAY WATER CLOSURES DUE TO SEWAGE SPILLS

When a known release of sewage is reported to the Ocean Water Protection Program staff, the ocean or bay water areas that may be affected by the sewage discharge are immediately closed to ocean water-contact sports.

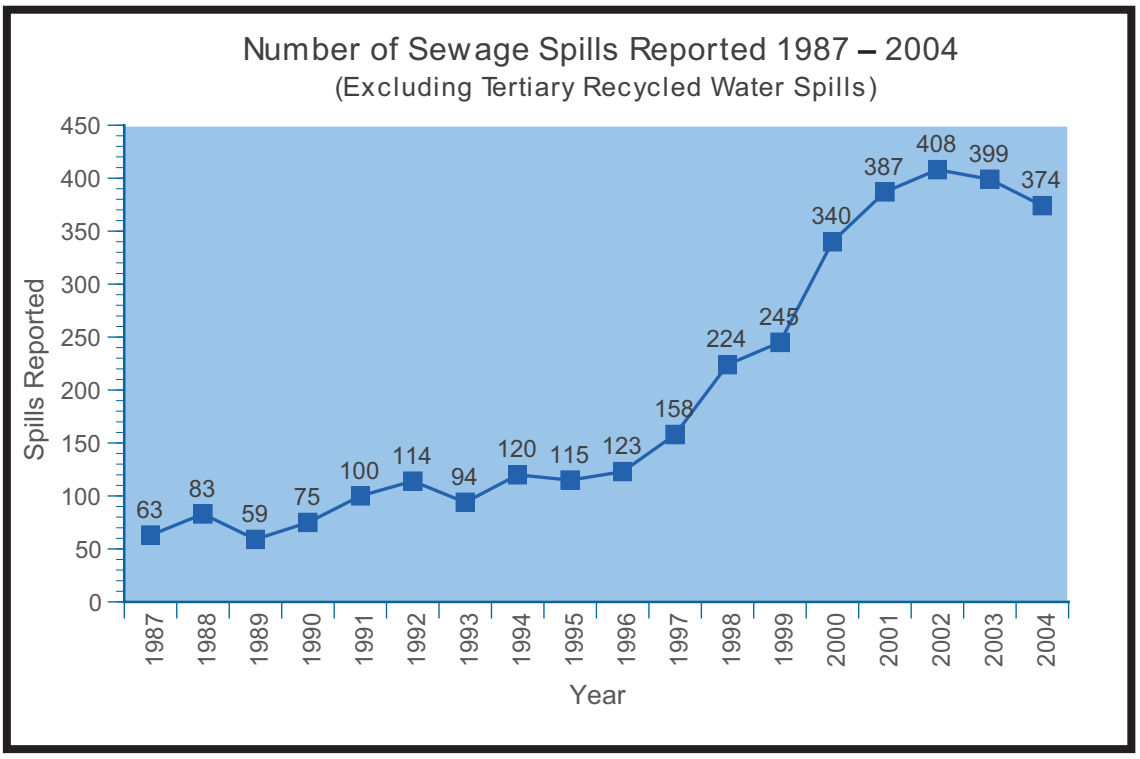
The closure area is based on many factors including type of sewage (e.g., untreated, secondary treated, etc.), volume of spill, location of spill, ocean currents and tides, historical sewage spills in the area, and any other pertinent information. After the initial closure area is established, the appropriate agencies are notified, the area is posted with closure signs, a press release is issued, the Ocean and Bay Water Closure and Posting Hotline and Web page are updated with the beach closure information, and bacterial sampling of the affected area is initiated.

The closed ocean or bay water area will be reopened or reduced in size when the contamination source has been eliminated and after two daily consecutive sampling results indicate the affected area meets the AB 411 Ocean Water-Contact Sports Standards.

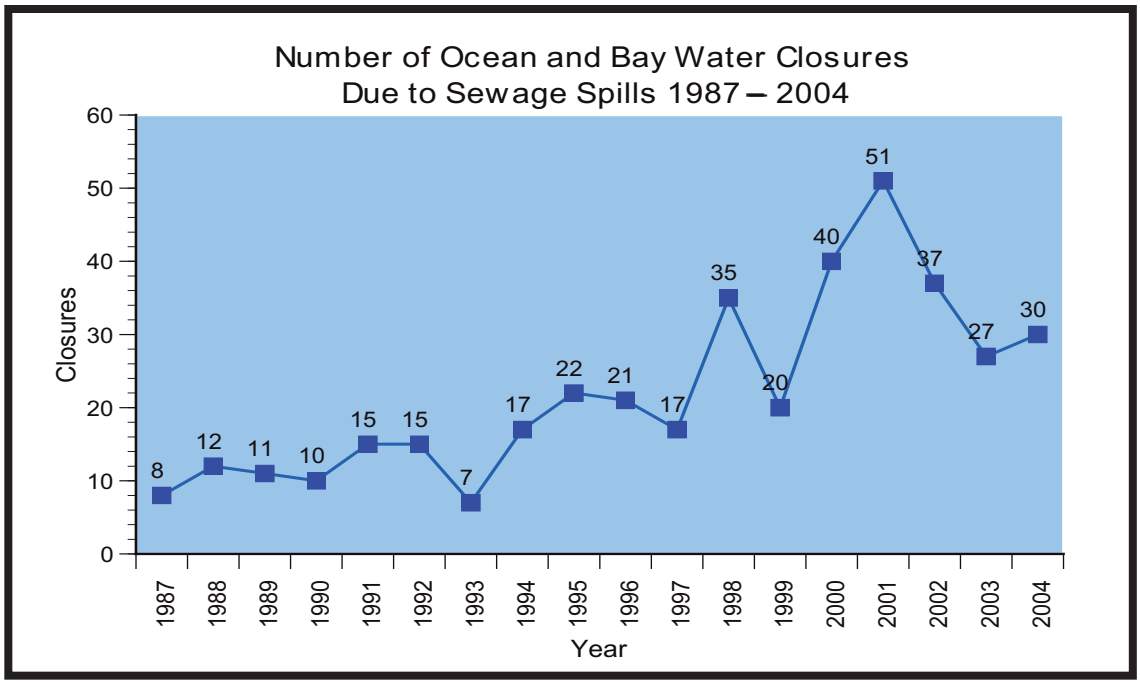
Status information regarding the closure is posted on the Ocean and Bay Water Closure and Posting Hotline at (714) 433-6400 and to the Ocean and Bay Water Closure and Posting Web Page at www.ocbeachinfo.com. Detailed information regarding closure events from 1999 - present may be downloaded from the Ocean and Bay Water Closure logs on the Web page.

Sewage Spills and Ocean and Bay Water Closures 1987 – 2004

The number of sewage spills reported to the Ocean Water Protection Program staff by sanitation districts, cities that operate sewage collection systems and private property owners from 1987 – 2004 is detailed in the following graph.

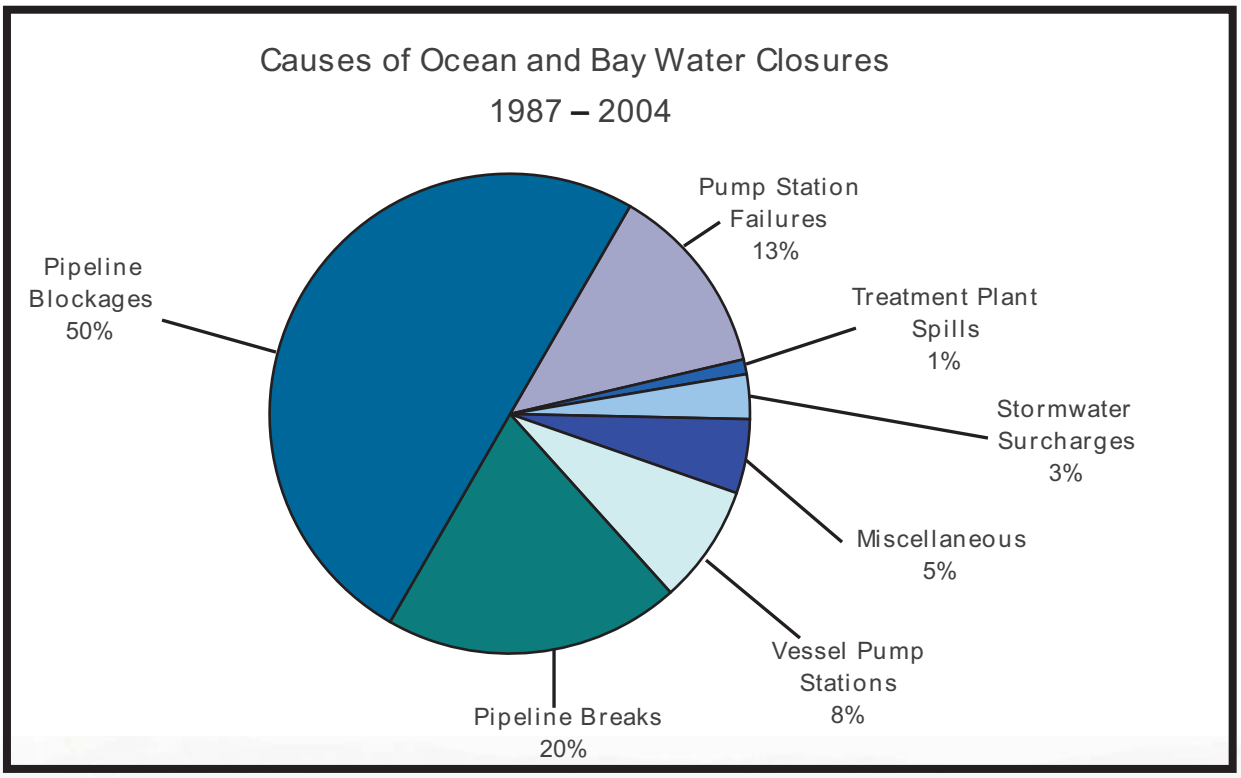


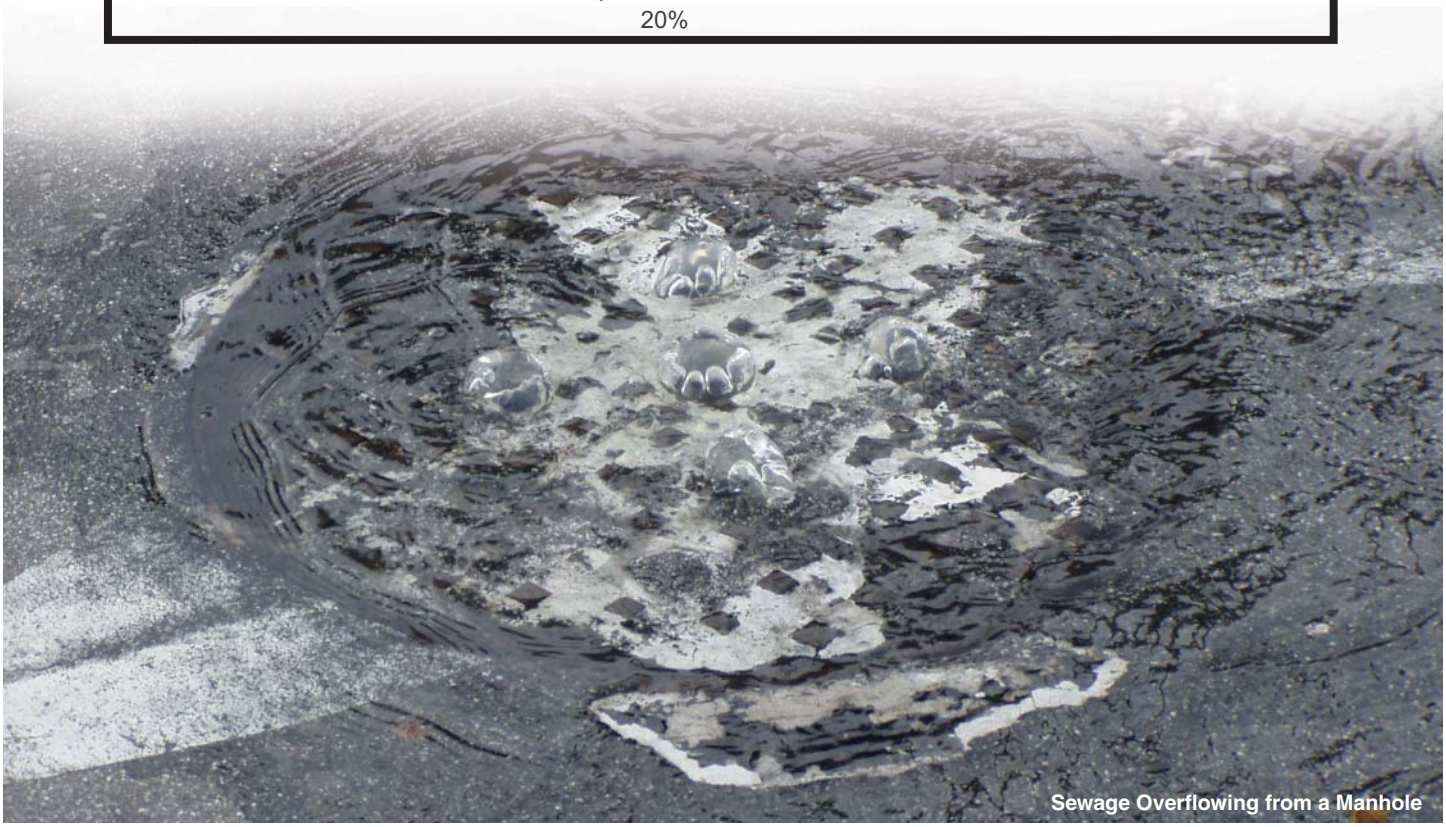
The number of ocean and bay water closures in Orange County due to sewage spills from 1987 – 2004 is summarized in the following graph. In 2004, the number of sewage spill related ocean and bay closures increased slightly after a two-year decrease.



Sewage Spills and Ocean and Bay Water Closures 1987 – 2004—continued

Sewage spills caused by pipeline blockages and pipeline breaks were responsible for the majority (70%) of the ocean and bay water closures in Orange County from 1987 – 2004, as the following chart illustrates.

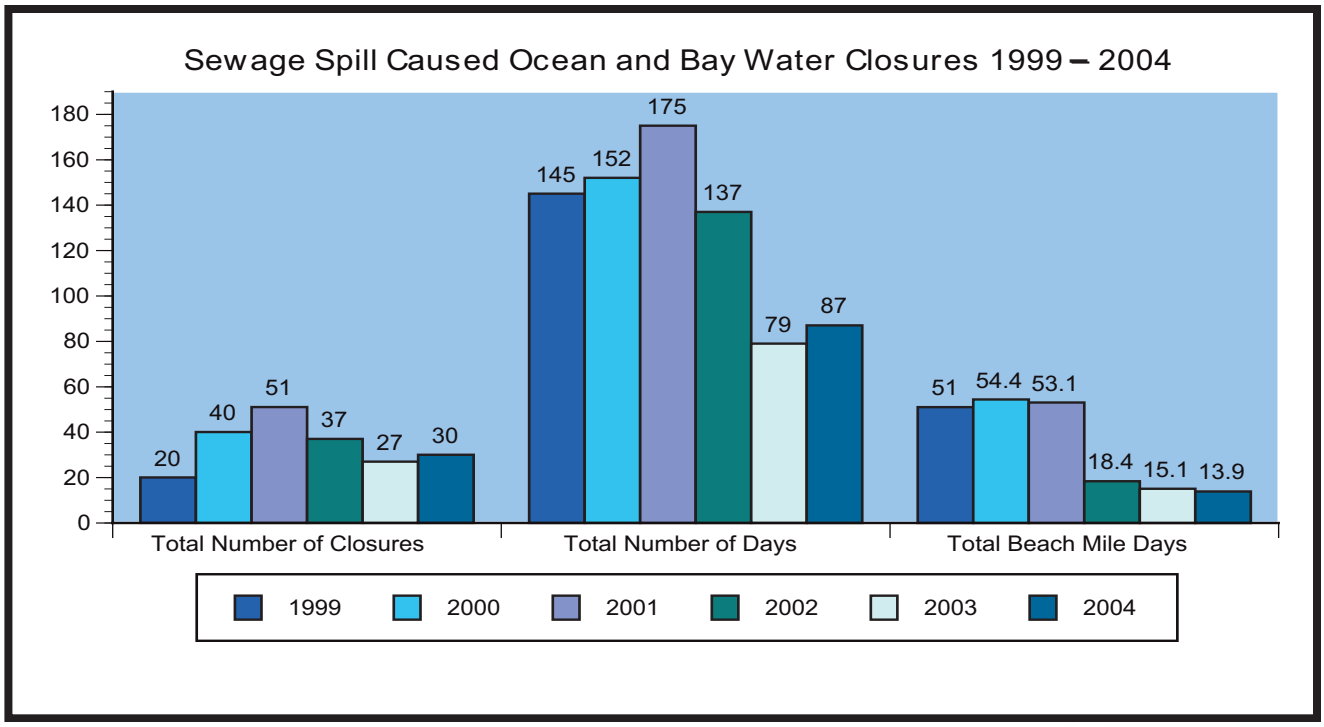




Sewage Overflowing from a Manhole

Sewage Spill Caused Ocean and Bay Water Closures 1999 – 2004

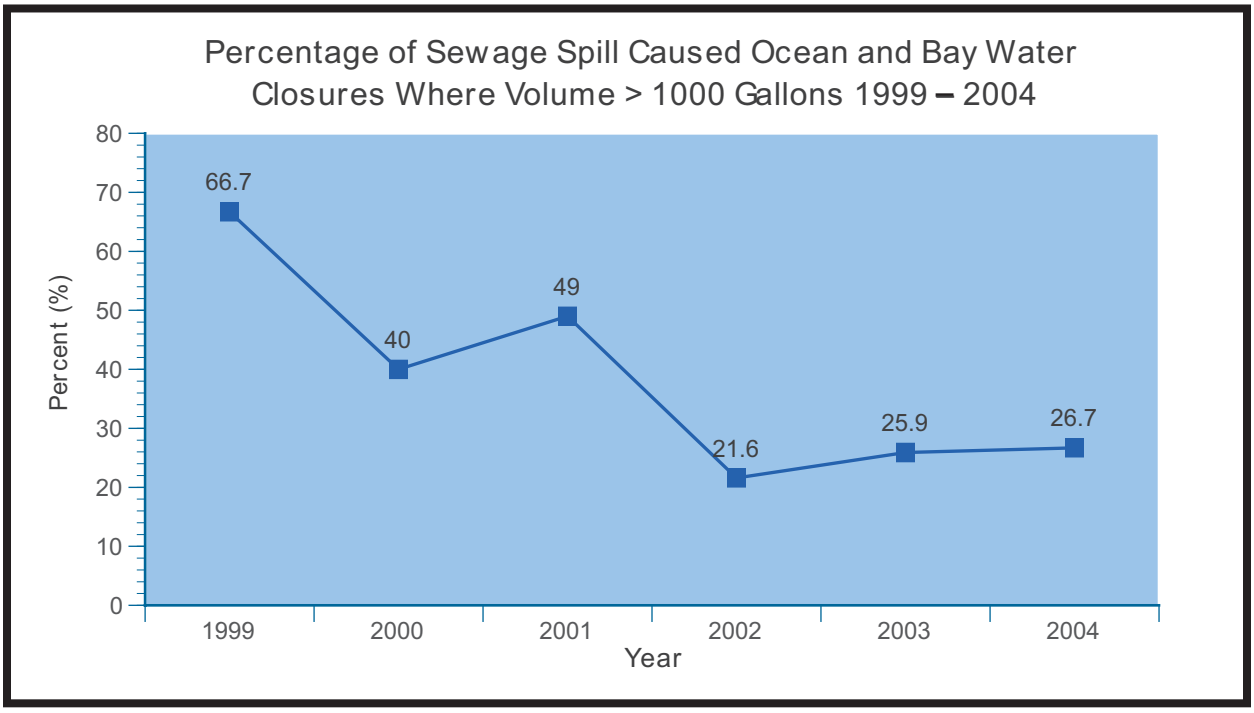
The following chart depicts the total number of sewage spill caused ocean and bay water closures, total number of closure days and total number of Beach Mile Days of closure in Orange County from 1999 – 2004. In 2004, the total number of Beach Mile Days of closures declined for the fourth consecutive year.



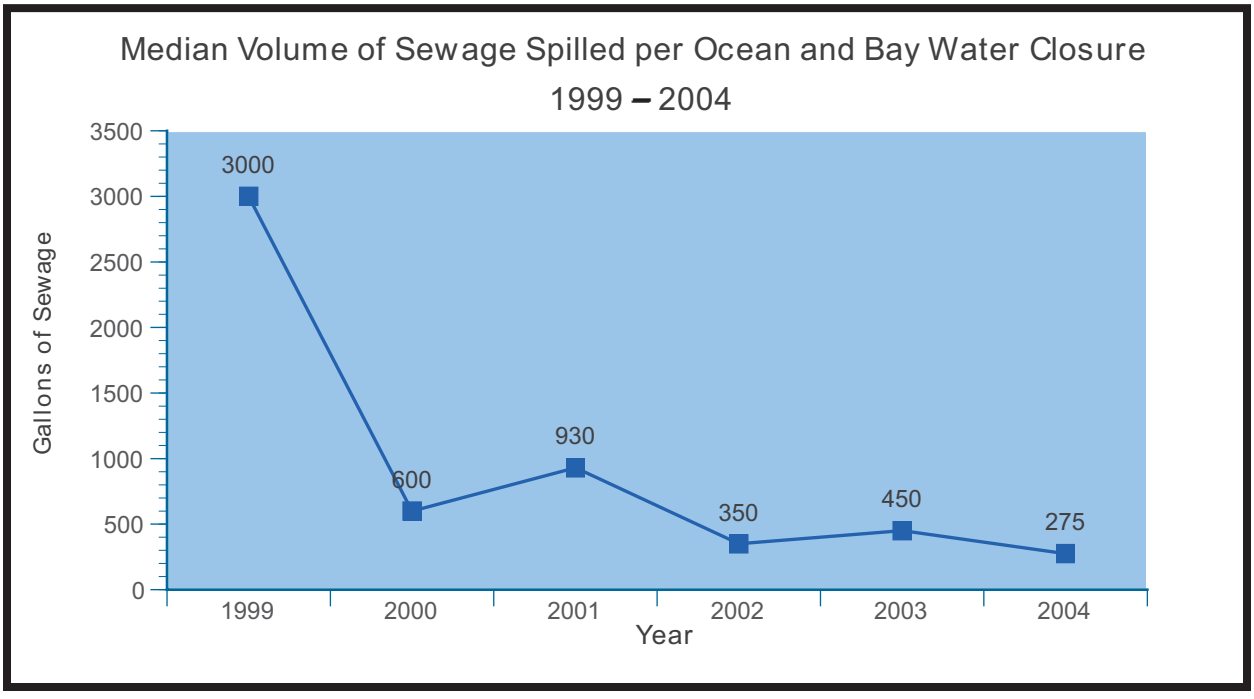
Ocean Water Closure Due to a Sewage Spill

Sewage Spill Caused Ocean and Bay Water Closures 1999 – 2004—continued

The following graph depicts the percentage of sewage spill caused ocean and bay water closures from 1999 – 2004 where the volume of sewage spilled was greater than 1000 gallons. The percentage of closures caused by sewage spills where the volume of sewage spilled was greater than 1000 gallons, has remained virtually unchanged from 2002 – 2004.

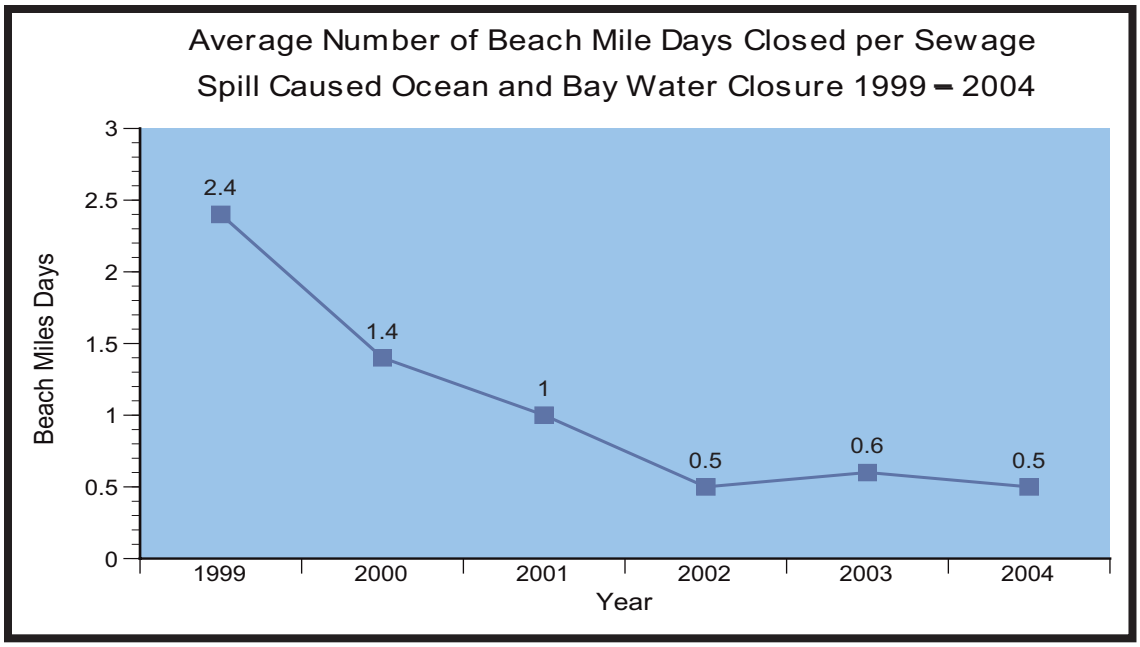


The following graph illustrates the median volume of sewage discharged per sewage spill closure incident from 1999 – 2004. The median volume of sewage spilled in 2004 was the lowest median value of sewage spilled per closure since 1999.

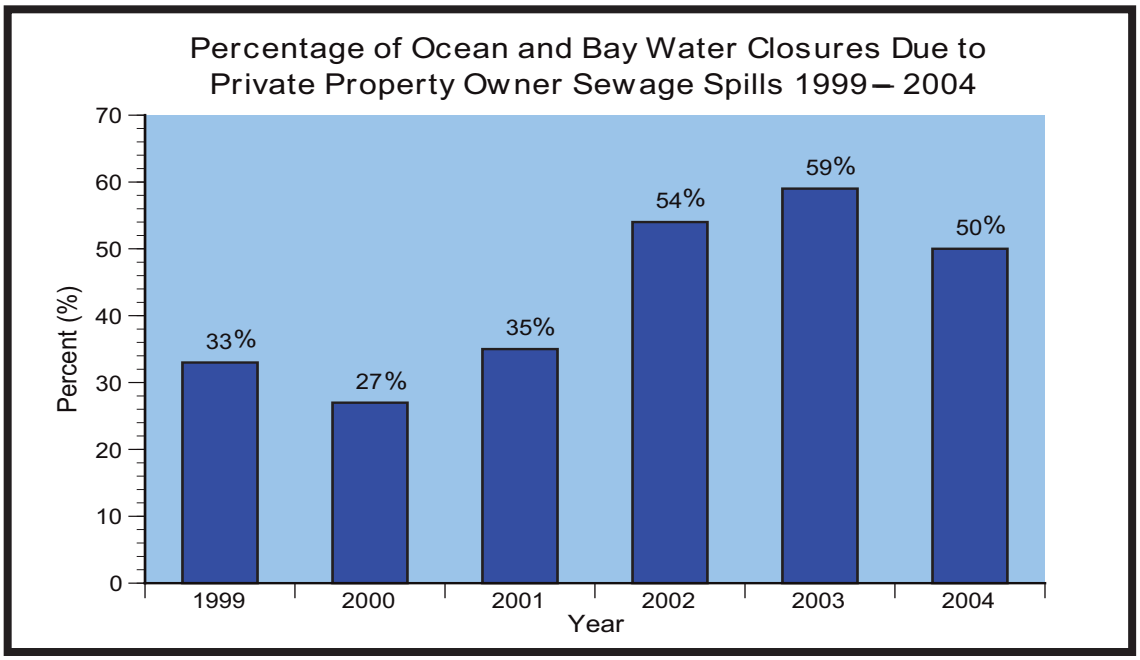


Sewage Spill Caused Ocean and Bay Water Closures 1999 – 2004—continued

The average number of Beach Mile Days closed per sewage spill caused ocean and bay water closure incident from 1999 – 2004 is shown in the following graph. The average number of Beach Mile Days closed per sewage spill closure incident has remained constant from 2002 – 2004.

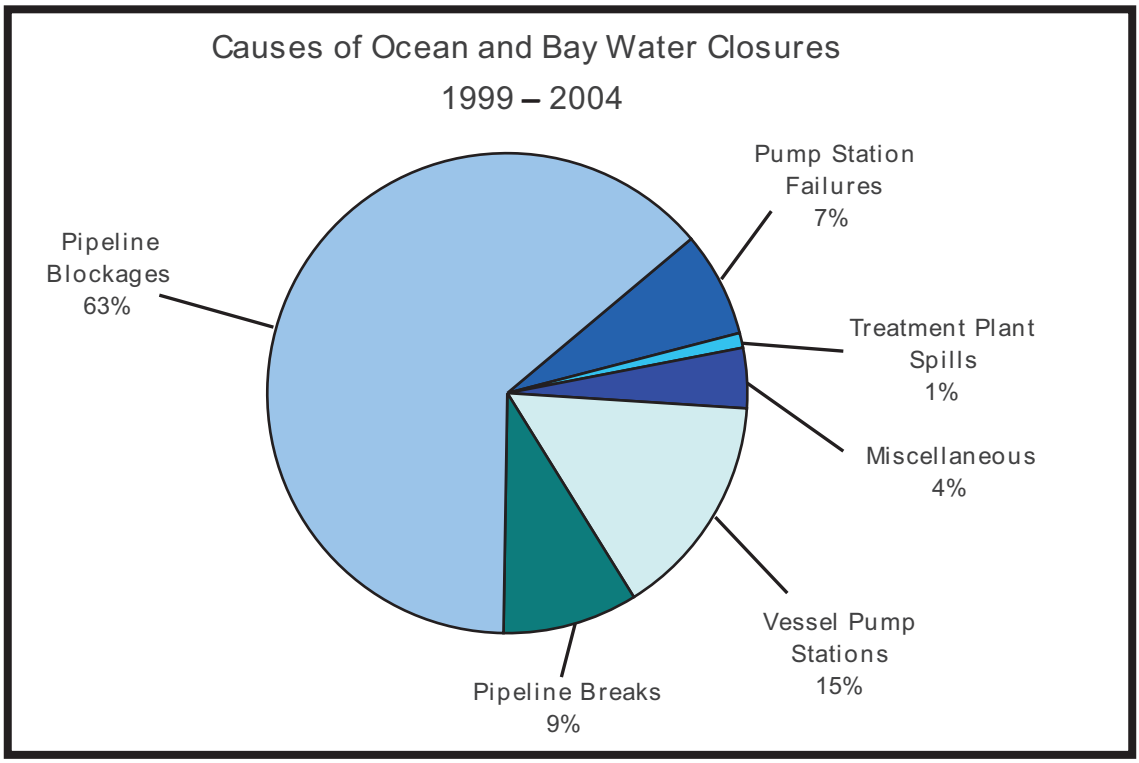


The percentage of ocean and bay water closures that resulted from private property owner sewage spills (e.g., apartment/condominium complexes, restaurants, vessel pump stations, etc.) from 1999 – 2004 is shown in the following chart. Private property owners were responsible for the majority of the ocean and bay water closures in Orange County from 2002 – 2004.

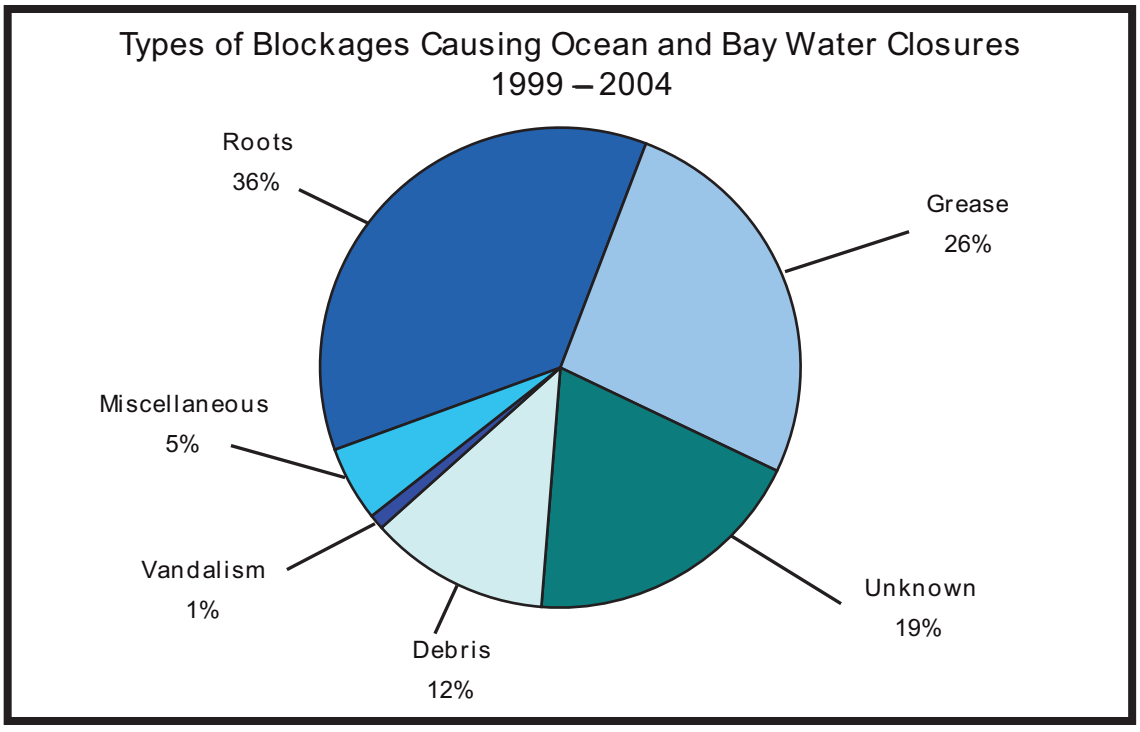


Sewage Spill Caused Ocean and Bay Water Closures 1999 – 2004—continued

The following chart illustrates that sewage pipeline blockages caused the majority (63%) of the ocean and bay water closures in Orange County from 1999 – 2004.

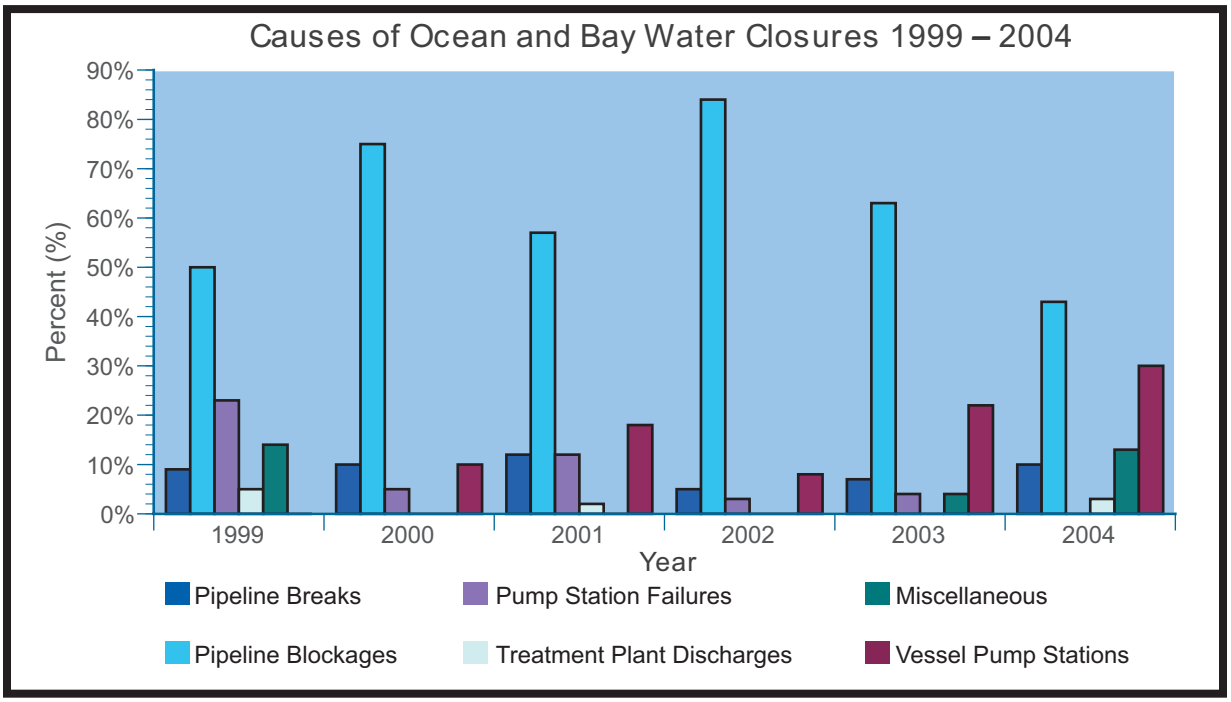


The infiltration of roots and deposition of grease into sewer pipes accounted for the majority (62%) of the pipeline blockages that resulted in ocean and bay water closures in Orange County from 1999 – 2004, as the following chart illustrates.

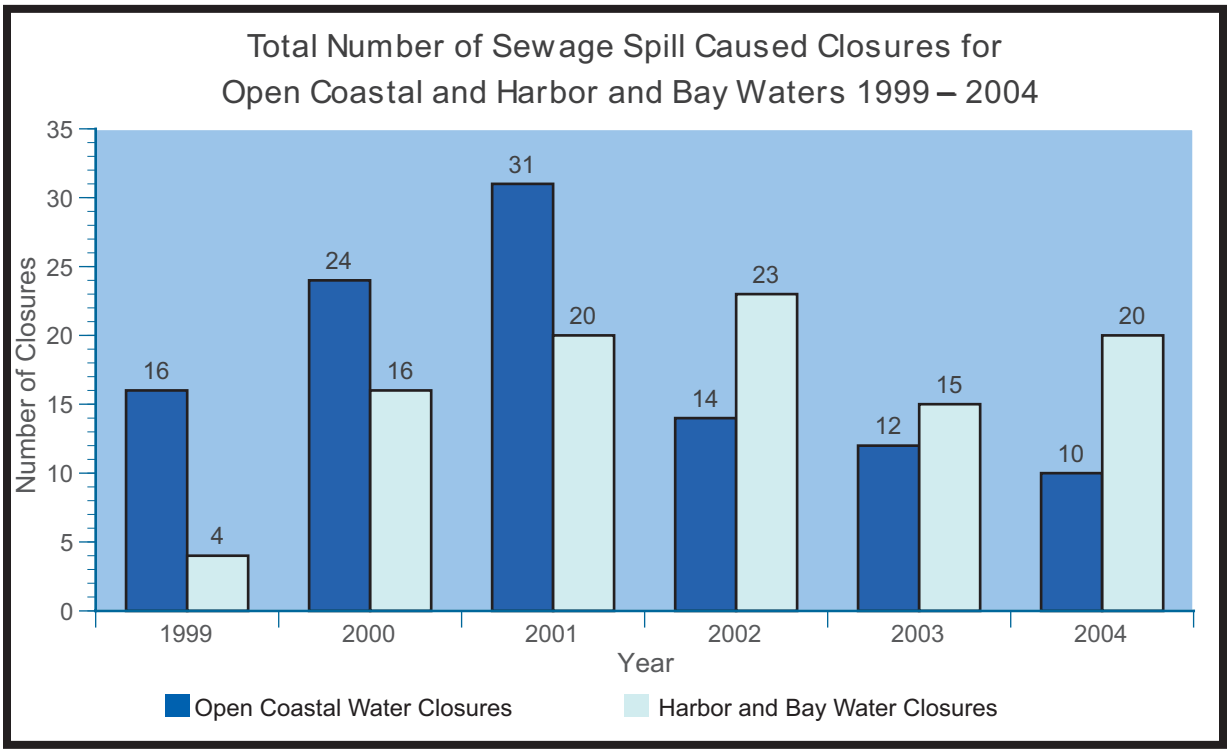


Sewage Spill Caused Ocean and Bay Water Closures 1999 – 2004—continued

The following chart illustrates that, from 2002 – 2004, the percentage of sewage spill caused ocean and bay water closures due to pipeline blockages has decreased, while the percentage of ocean and bay water closures due to vessel pump station failures has increased.



The following chart compares the total number of open coastal water closures to the total number of harbor and bay closures in Orange County due to sewage spills from 1999 – 2004. The total number of harbor and bay water closures exceeded the total number of open coastal water closures from 2002 – 2004.



OCEAN AND BAY RAIN ADVISORIES 2000 – 2004

During and after a significant rainstorm event, storm drains, creeks and rivers carry floodwaters and urban runoff (which may include fertilizers, road oils, litter and large amounts of bacteria from a variety of sources such as animal waste and decomposing vegetation) to ocean and bay waters.

The levels of bacteria can rise significantly in ocean and bay waters close to discharging storm drains and outlets of creeks, rivers and streams during and after rainstorms. To ensure that public health and safety is protected, the Ocean Water Protection Program staff advises against the use of ocean or bay waters where there may be contamination due to storm runoff. The elevated bacterial levels in the coastal ocean waters may continue for a period of at least three days depending on the intensity of the rain and the volume of runoff. Swimmers should avoid Orange County coastal waters during and after rainstorms and beach users should avoid contact with any runoff on the beach during dry or wet weather conditions.

A press release is issued during or after a rainstorm event of greater than or equal to two-tenths of an inch (≥0.20”), unless multiple events occur during the 72-hour window of the previous rainstorm. In those cases, the existing rain advisory continues for an additional 72 hours. The Ocean and Bay Water Closure and Posting Hotline and Web Page are updated with the rain advisory information.

The dates listed below are the periods that an ocean and bay water rain advisory was in effect for Orange County during 2000 - 2004.

YEAR 2000 (55 Total Rain Advisory Days)
January 25 – February 2
February 10 – February 16
February 17 – February 27
February 28 – March 13
April 17 – April 23
September 23 – September 25
October 11 – October 15
October 27 – November 2

YEAR 2001 (74 Total Rain Advisory Days)
January 8 – January 16
January 24 – January 31
February 10 – February 16
February 20 – March 13
April 7 – April 13
April 21 – April 24
November 12 – November 16
November 24 – November 27
November 29 – December 6
December 14 – December 18
December 21 – December 25
December 30 – December 31

YEAR 2002 (44 Total Rain Advisory Days)
January 1 – January 3
January 28 – February 1
February 17 – February 21
March 7 – March 11
March 18 – March 21
March 23 – March 27
November 8 – November 13
November 30 – December 3
December 16 – December 31

YEAR 2003 (54 Total Rain Advisory Days)
January 1 – January 2
January 8 – January 12
February 11 – February 17
February 25 – March 2
March 15 – March 19
April 14 – April 18
May 3 – May 7
July 30 – August 3
November 1 – November 7
November 13 – November 19
December 8 – December 11
December 15 – December 18
December 25 – December 28

YEAR 2004 (65 Total Rain Advisory Days)
January 2 – January 6
February 3 – February 6
February 18 – March 6
April 2 – April 5
April 17 – April 20
October 17 – October 24
October 26 – November 1
November 8 – November 12
November 21 – November 25
November 27 – December 1
December 5 – December 12
December 28 – December 31

OCEAN AND BAY WATER POSTINGS DUE TO BACTERIOLOGICAL WATER QUALITY STANDARDS VIOLATIONS

In July of 1999, when the state regulations for the AB 411 Ocean Water-Contact Sports Standards were established, the Ocean Water Protection Program staff began posting the required health warning signs at public beaches where the ocean or bay waters failed to meet the bacteriological standards.

Bacteriological water samples are collected each week at approximately 150 ocean, bay and drainage locations throughout Orange County. The Ocean Water Protection Program staff receive the results of 500-600 bacteriological water analyses each week. The results are reviewed on a daily basis to determine compliance with the seven standards.

When a bacteriological water sample fails to meet any of the AB 411 Ocean Water-Contact Sports Standards the following occurs:

- Warning signs are posted at the affected ocean or bay areas indicating that the waters have exceeded health standards.
- The information regarding the posted areas is updated on the Ocean and Bay Water Closure and Posting Hotline at (714) 433-6400 and Web Page at www.ocbeachinfo.com.
- Additional bacteriological water samples are collected at the posted areas and the results are evaluated daily to determine if the areas posted with warning signs should be increased, reduced, shifted or removed.

Because ocean or bay waters which violate the AB 411 Ocean Water-Contact Sports Standards may cause illness to users, the County of Orange Health Care Agency recommends staying out of the water at all beach areas that are posted with the health warning sign shown below.

Postings for all Orange County Ocean and Bay Water Areas 2000 – 2004 (April – October)

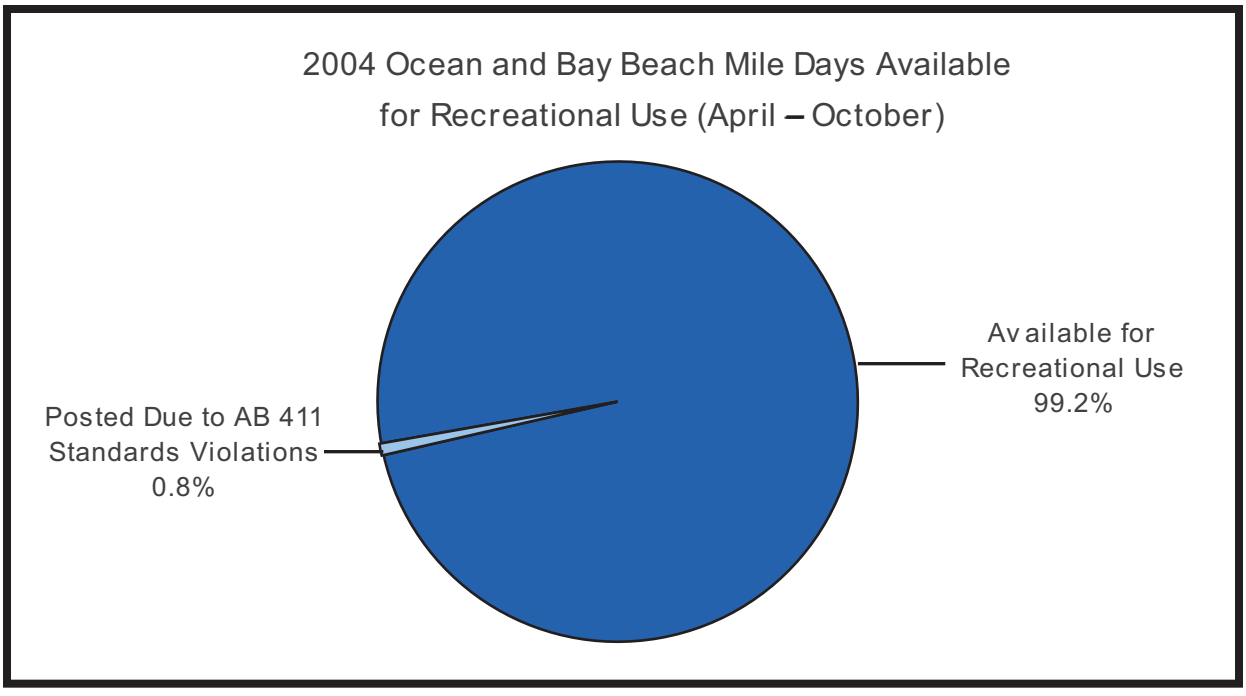
As required by the California Health and Safety Code Section 115910, violations of the AB 411 Ocean Water-Contact Sports Standards between April 1 and October 31 must be reported to the State of California Water Resources Control Board by all California coastal counties on a monthly basis. The information provided in this section is the data reported to the State Water Resources Control Board beginning with the year 2000, the first calendar year that the AB 411 Ocean Water-Contact Sports Standards were in place.

The total number of postings, total number of days posted, and total number of Beach Mile Days posted due to violations of AB 411 standards between April 1 and October 31 for all Orange County beach areas are shown in the following table.

Year	Postings	Days	Beach Mile Days
2000	199	2,123	362.8
2001	208	2,454	282.4
2002	308	2,456	366.0
2003	160	1,732	247.5
2004	141	1,877	196.8

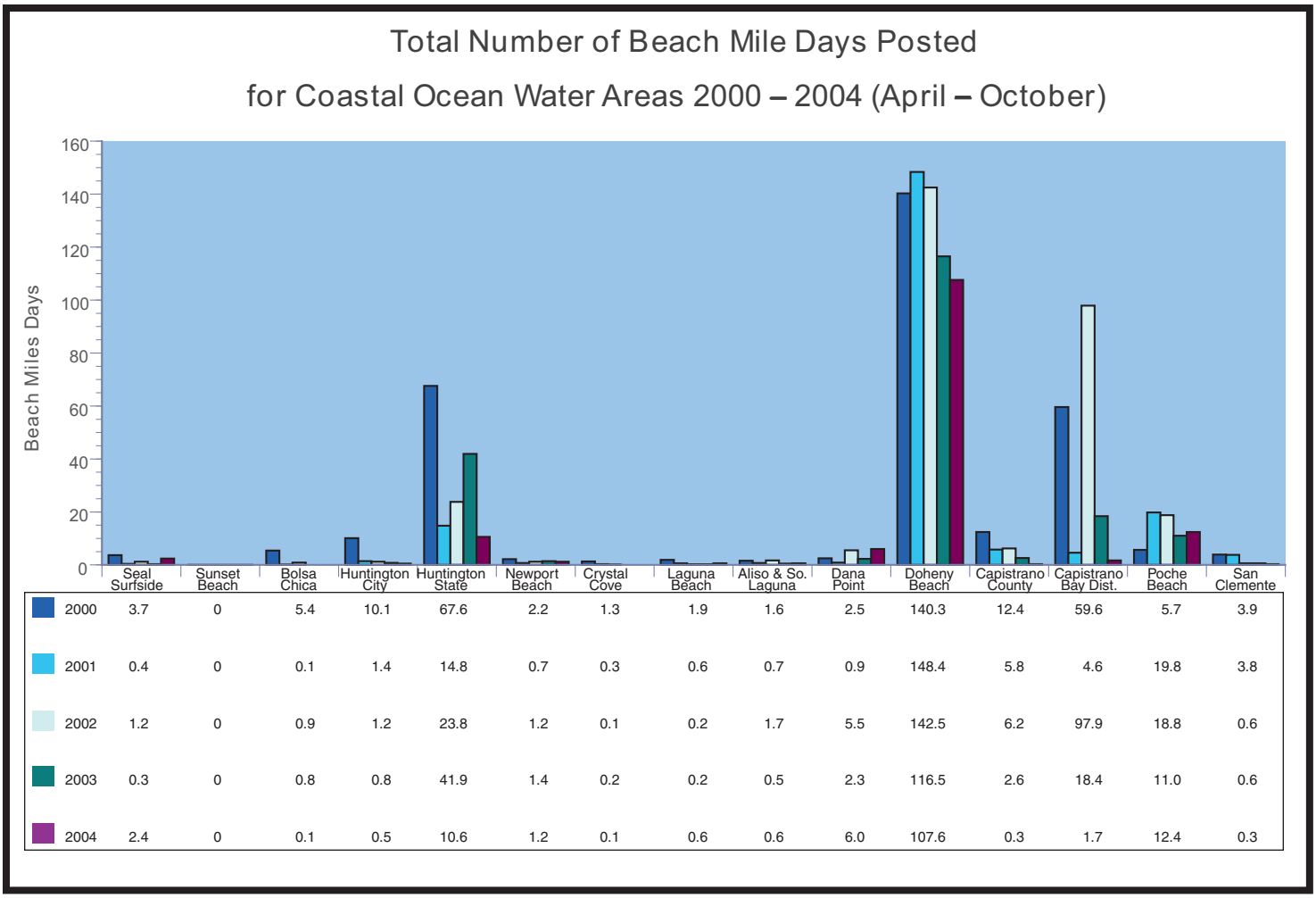
Note: This table does not include Newport Slough data for 2000 (Newport Slough stations added in 2001).

For 2004, the total number of Beach Mile Days posted due to AB 411 standards violations between April 1 and October 31 represents a small percentage (0.8%) of the total number of Beach Mile Days available for recreational water use during this period, as the following chart indicates.



AB 411 Period Postings for Coastal Ocean Water Areas 2000 – 2004 (April – October)

The total number of Beach Mile Days posted due to AB 411 standards violations between April 1 and October 31 at each Orange County coastal ocean water areas from 2000 – 2004 is depicted in the following graph. The coastal ocean water areas of Doheny State Beach, Capistrano Bay District Beach and Huntington State Beach have the highest cumulative total number of Beach Mile Days postings for 2000 – 2004.

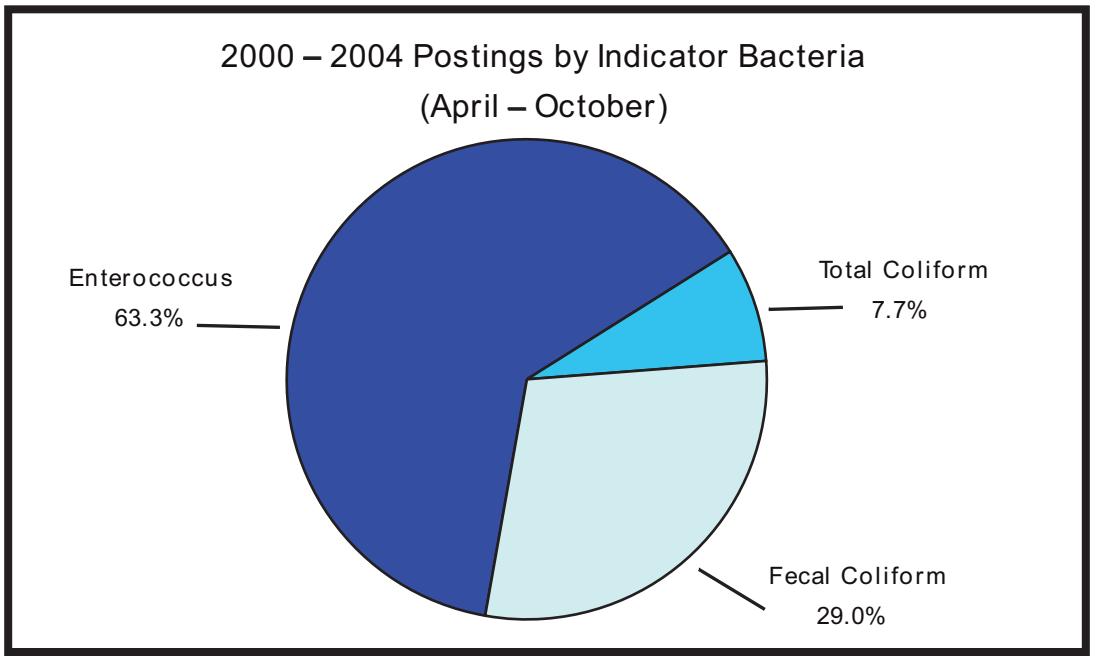


	Seal Surfside	Sunset Beach	Bolsa Chica	Huntington City	Huntington State	Newport Beach	Crystal Cove	Laguna Beach	Aliso & So. Laguna	Dana Point	Doheny Beach	Capistrano County	Capistrano Bay Dist.	Poche Beach	San Clemente
2000	3.7	0	5.4	10.1	67.6	2.2	1.3	1.9	1.6	2.5	140.3	12.4	59.6	5.7	3.9
2001	0.4	0	0.1	1.4	14.8	0.7	0.3	0.6	0.7	0.9	148.4	5.8	4.6	19.8	3.8
2002	1.2	0	0.9	1.2	23.8	1.2	0.1	0.2	1.7	5.5	142.5	6.2	97.9	18.8	0.6
2003	0.3	0	0.8	0.8	41.9	1.4	0.2	0.2	0.5	2.3	116.5	2.6	18.4	11.0	0.6
2004	2.4	0	0.1	0.5	10.6	1.2	0.1	0.6	0.6	6.0	107.6	0.3	1.7	12.4	0.3

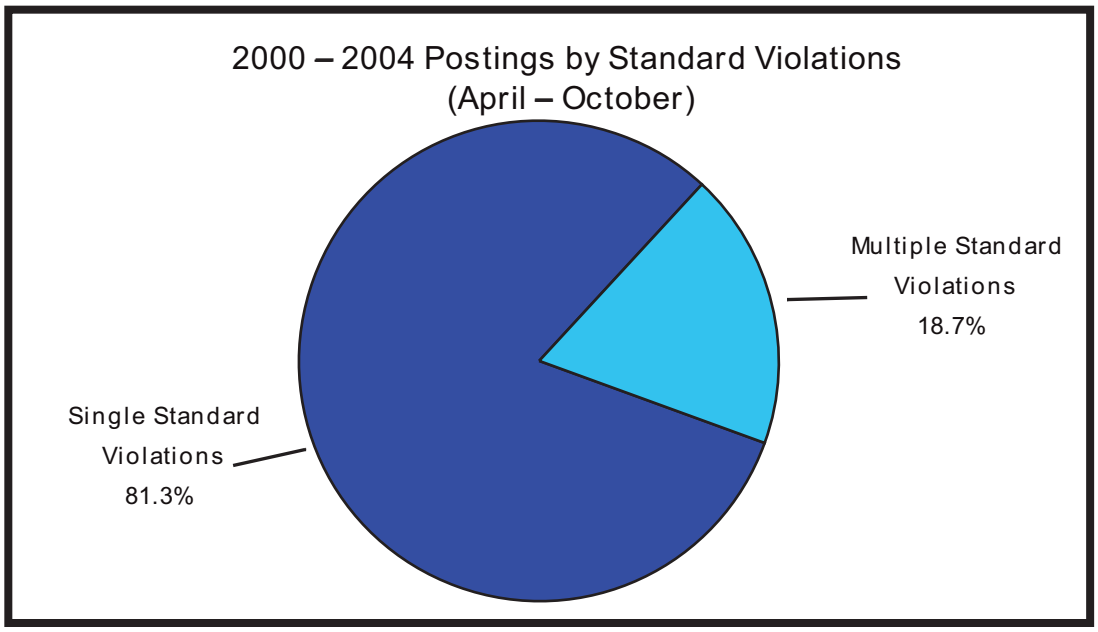
Newport Beach

Postings by Indicator Bacteria 2000 – 2004 (April – October)

Violations of the single sample enterococcus standard accounted for the majority (63.3%) of the ocean and bay water postings that occurred in Orange County between April 1 and October 31 for 2000 – 2004, as the following chart indicates.



Violations of a single sample standard accounted for the majority (81.3%) of the ocean and bay water postings that occurred in Orange County between April 1 and October 31 for 2000 – 2004. Multiple standard violations (a combination of either total coliforms and fecal coliforms, fecal coliforms and enterococci, or all three) accounted for 18.7% of the postings.



Calendar Year Postings for Coastal Ocean Water Areas 2000 – 2004

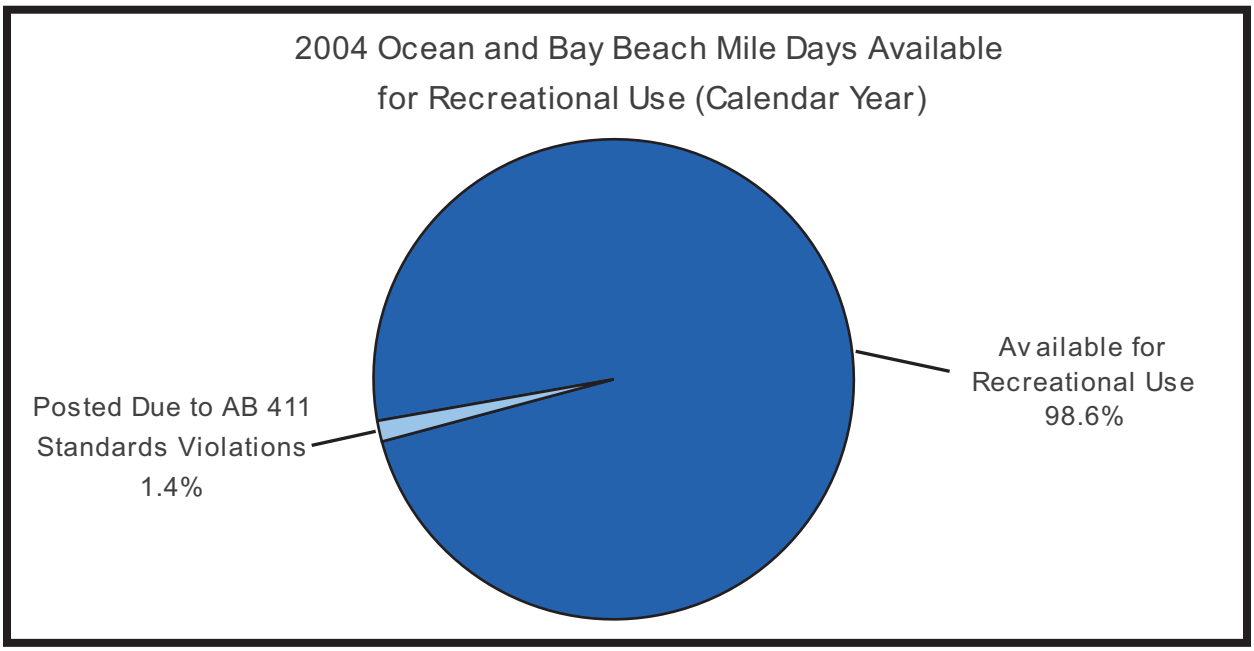
Due to year round recreational water use, Orange County implements the Ocean Water-Contact Sports Standards on a continuous basis. Violations are reported to the State of California Water Resources Control Board monthly with the exception of violations occurring when a rain advisory is in effect. The information provided in this section is the data reported to the State Water Resources Control Board beginning with the year 2000, the first calendar year that the AB 411 Ocean Water-Contact Sports Standards were in place.

The total number of postings, total number of days posted, and total number of Beach Mile Days posted due to violations of AB 411 standards between January 1 and December 31 for all Orange County beach areas are shown in the table below.

Year	Postings	Days	Beach Mile Days
2000	289	3,839	675.1
2001	321	4,563	716.8
2002	309	4,611	768.6
2003	309	3,875	644.4
2004	216	3,333	562.3

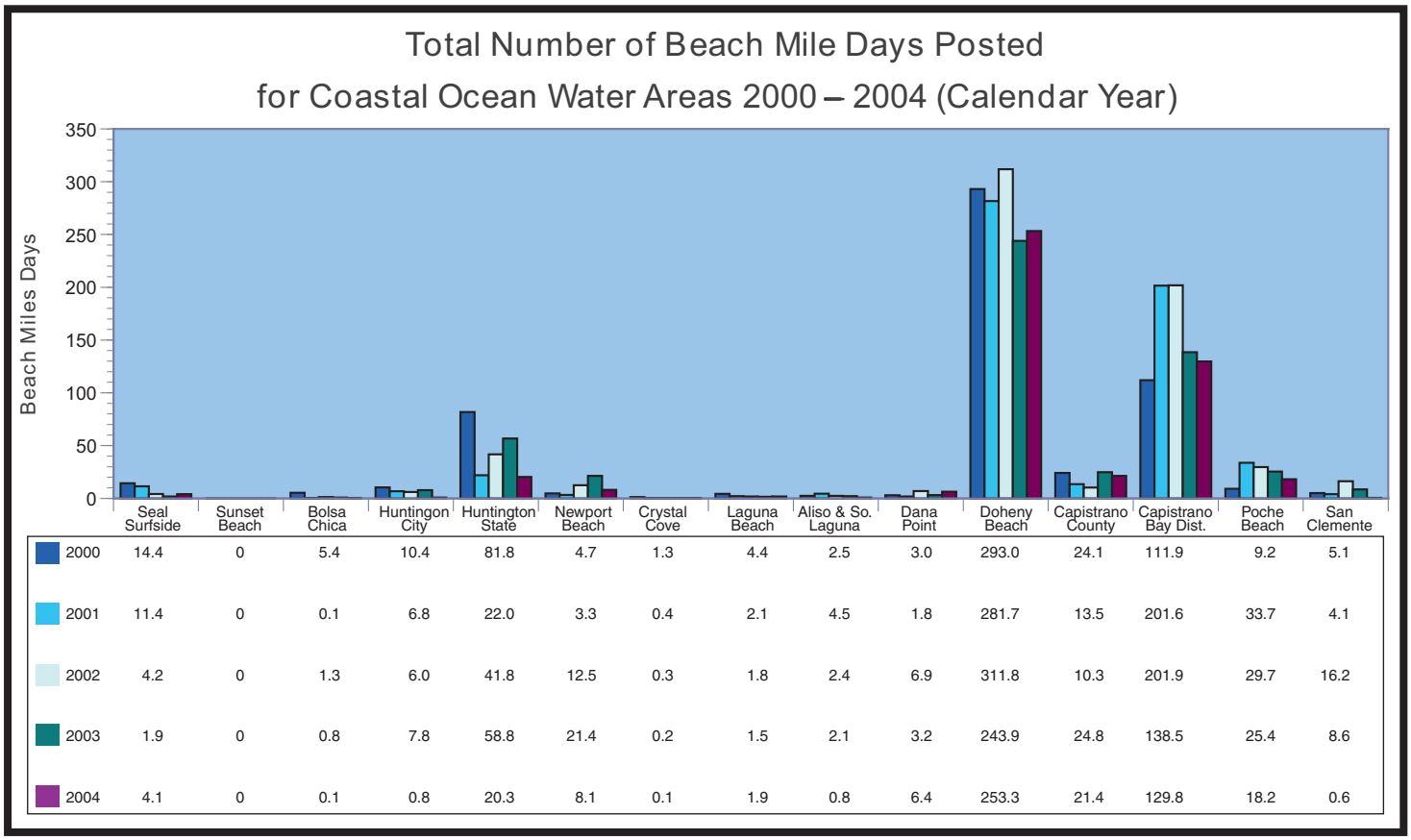
Note: This table does not include Newport Slough data for 2000 (Newport Slough stations added in 2001).

For 2004, the total number of Beach Mile Days posted due to AB 411 standards violations between January 1 and December 31 represents a small percentage (1.4%) of the total number of Beach Mile Days available for recreational water use during this period, as the following chart indicates.



Calendar Year Postings for Coastal Ocean Water Areas 2000 – 2004—continued

The total number of Beach Mile Days posted due to AB 411 standards violations for the calendar year at each Orange County coastal ocean water areas from 2000 – 2004 is depicted in the following graph. The coastal ocean water areas of Doheny State Beach, Capistrano Bay District Beach and Huntington State Beach have the highest cumulative total number of Beach Mile Days postings for 2000 – 2004.



	Seal Surfside	Sunset Beach	Bolsa Chica	Huntington City	Huntington State	Newport Beach	Crystal Cove	Laguna Beach	Aliso & So. Laguna	Dana Point	Doheny Beach	Capistrano County	Capistrano Bay Dist.	Poche Beach	San Clemente
2000	14.4	0	5.4	10.4	81.8	4.7	1.3	4.4	2.5	3.0	293.0	24.1	111.9	9.2	5.1
2001	11.4	0	0.1	6.8	22.0	3.3	0.4	2.1	4.5	1.8	281.7	13.5	201.6	33.7	4.1
2002	4.2	0	1.3	6.0	41.8	12.5	0.3	1.8	2.4	6.9	311.8	10.3	201.9	29.7	16.2
2003	1.9	0	0.8	7.8	58.8	21.4	0.2	1.5	2.1	3.2	243.9	24.8	138.5	25.4	8.6
2004	4.1	0	0.1	0.8	20.3	8.1	0.1	1.9	0.8	6.4	253.3	21.4	129.8	18.2	0.6

Laguna Beach

APPENDIX 1

Postings by Ocean and Bay Water Areas 2000 – 2004

The following tables, arranged in geographical order, provide sample collection information for each Orange County ocean and bay water area, and indicate the total number of postings, total number of days posted, and the total number of Beach Mile Days posted due to AB 411 standards violations between April 1 and October 31 and for the calendar year (dry weather data only) for 2000 – 2004.

• SEAL BEACH / SURFSIDE

Sampling Agency:	County of Orange Environmental Health
Sampling Frequency:	1 sample per week
Sampling Stations:	5
Sampling Locations:	1st Street, 8th Street, South of Pier, 14th Street, Sea Way
Beach Miles:	2 miles of coastal beach
Available AB411 BMDs:	428 BMDs
Available Yearly BMDs:	730 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	6	47	3.7
2001	3	6	0.4
2002	5	22	1.2
2003	3	5	0.3
2004	3	18	2.4

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	8	109	14.4
2001	10	57	11.4
2002	11	74	4.2
2003	13	29	1.9
2004	8	47	4.1

Seal Beach

• SUNSET BEACH

Sampling Agency: County of Orange Environmental Health
Sampling Frequency: 1 sample per week
Sampling Stations: 1
Sampling Locations: Broadway
Beach Miles: 1 mile of coastal beach
Available AB411 BMDs: 214 BMDs
Available Yearly BMDs: 365 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	0	0	0
2004	0	0	0

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	0	0	0
2004	0	0	0

Sunset Beach

• BOLSA CHICA STATE BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Stations: 2
Sampling Locations: Bolsa Chica Reserve, Bolsa Chica Beach
Beach Miles: 2.8 miles of coastal beach
Available AB411 BMDs: 599.2 BMDs
Available Yearly BMDs: 1,022 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	6	12	5.4
2001	1	1	0.1
2002	7	11	0.9
2003	8	14	0.8
2004	1	1	0.1

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	6	12	5.4
2001	1	1	0.1
2002	10	16	1.3
2003	8	14	0.8
2004	1	1	0.1

Bolsa Chica State Beach

• HUNTINGTON HARBOUR

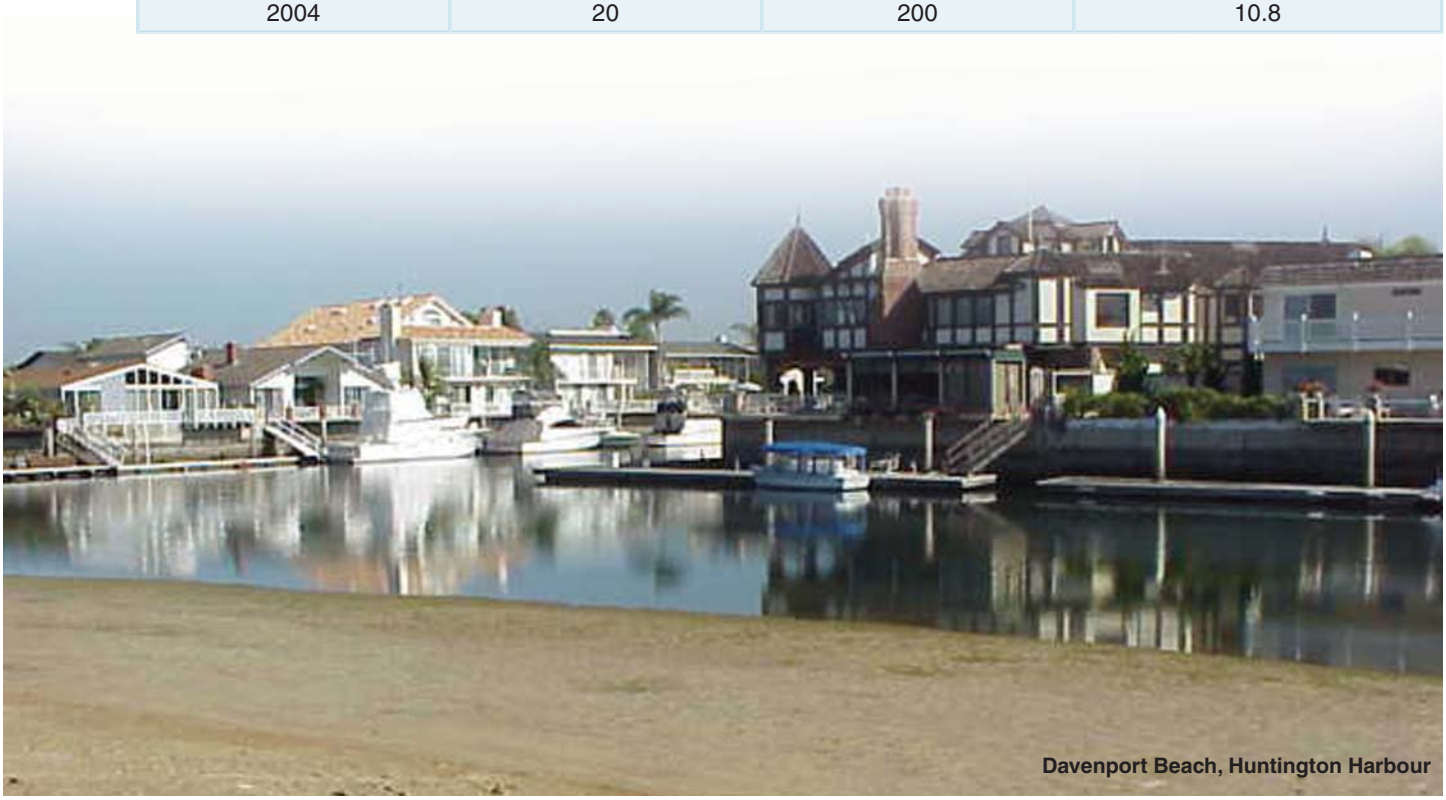
Sampling Agency:	County of Orange Environmental Health
Sampling Frequency:	1 sample per week
Sampling Stations:	14
Sampling Locations:	Sunset Aquatic Marina, Mother's Beach, Trinidad Lane Beach, Sea Gate, Humbolt Beach, Davenport Beach, Clubhouse Marina, Harbour Channel, 11th Street Beach, Admiralty Drive, Anderson Street Marina, Anaheim Bay Gas Dock, Coral Cay Beach, Bolsa Bay
Beach Miles:	31.1 miles of harbor frontage
Available AB411 BMDs:	6,655.4 BMDs
Available Yearly BMDs:	11,351.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	16	100	4.7
2001	34	182	18.0
2002	24	134	7.3
2003	15	73	4.0
2004	8	31	1.2

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	27	196	8.7
2001	56	492	24.1
2002	43	394	21.3
2003	35	270	15.6
2004	20	200	10.8



Davenport Beach, Huntington Harbour

• HUNTINGTON CITY BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Stations: 4
Sampling Locations: Bluffs, 17th Street, Jack's Snack Bar, Beach Blvd.
Beach Miles: 3.5 miles of coastal beach
Available AB411 BMDs: 749 BMDs
Available Yearly BMDs: 1,277.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	6	10	10.1
2001	10	16	1.4
2002	7	14	1.2
2003	7	12	0.8
2004	4	8	0.5

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	9	16	10.4
2001	14	24	6.8
2002	21	33	6.0
2003	21	36	7.8
2004	9	13	0.8

Huntington City Beach

• HUNTINGTON STATE BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Stations: 5
Sampling Locations: Beach Blvd., Newland Street, Magnolia Street, Brookhurst Street, Santa Ana River Mouth Beach
Beach Miles: 2.5 miles of coastal beach
Available AB411 BMDs: 535 BMDs
Available Yearly BMDs: 912.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	28	223	67.6
2001	29	70	14.8
2002	31	89	23.8
2003	21	72	41.9
2004	23	55	10.6

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	36	255	81.8
2001	38	119	22.0
2002	42	158	41.8
2003	38	122	56.8
2004	33	90	20.3

Huntington State Beach

• NEWPORT SLOUGH

Sampling Agency: County of Orange Environmental Health
Sampling Frequency: 1 sample per week
Sampling Stations: 2
Sampling Locations: Lancaster Street Beach, Grant Street Channel
Beach Miles: 0.1 miles of channel beach
Available AB411 BMDs: 21.4 BMDs
Available Yearly BMDs: 36.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	N/A	N/A	N/A
2001	6	324	3.5
2002	5	181	2.1
2003	6	111	1.4
2004	3	96	1.1

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	N/A	N/A	N/A
2001	9	381	5.1
2002	13	339	3.9
2003	14	308	3.5
2004	4	98	1.1

Newport Slough at the Santa Ana River, Newport Beach

• NEWPORT BAY

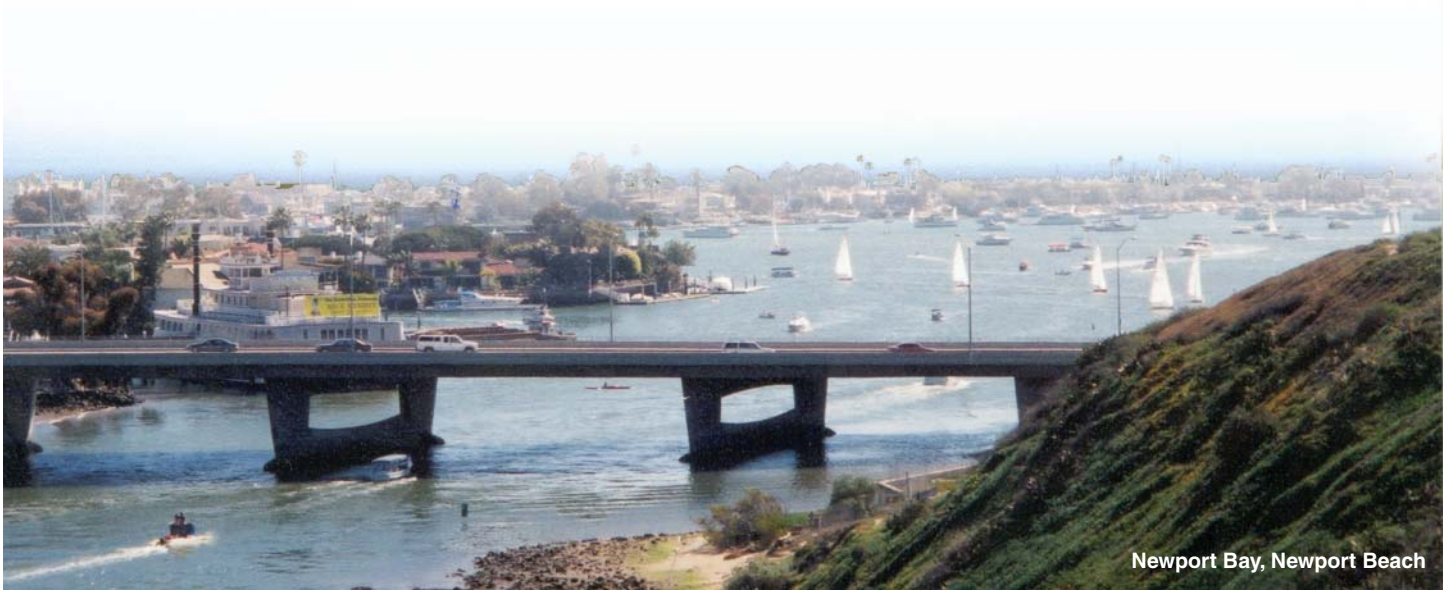
Sampling Agency:	County of Orange Environmental Health
Sampling Frequency:	1 sample per week
Sampling Stations:	31
Sampling Locations:	Newport Dunes Beach (East, Middle, West and North), Vaughn's Launch, Ski Zone, North Star Beach, Bayshore Beach, De Anza Launch Ramp, 43rd Street Beach, 38th Street Beach, 33rd Street Channel, Newport Blvd. Bridge Marina, Lido Yacht Club Beach, Via Genoa Beach, Rhine Channel, 19th Street Beach, 15th Street Beach, 10th Street Beach, Alvarado/Bay Isle Beach, "N" Street Beach, Garnet Avenue Beach, Ruby Avenue Beach, Sapphire Avenue Beach, Grand Canal, Abalone Avenue Beach, Park Avenue Beach, Onyx Avenue Beach, Promontory Point Channel, Bayside Drive Beach, Rocky Point Beach
Beach Miles:	39.5 miles of bay front
Available AB411 BMDs:	8,453 BMDs
Available Yearly BMDs:	14,417.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	56	929	32.0
2001	68	931	39.0
2002	43	905	35.6
2003	40	730	32.3
2004	31	768	31.5

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	75	1483	64.0
2001	94	1663	67.7
2002	61	1514	58.4
2003	74	1409	57.6
2004	39	1366	54.4



Newport Bay, Newport Beach

• NEWPORT BEACH

Sampling Agency:	Orange County Sanitation District, County of Orange Environmental Health
Sampling Frequency:	1 or 5 samples per week (agency dependent)
Sampling Stations:	9
Sampling Locations:	Orange Street, 52nd/53rd Street, 38th Street, Newport Pier, 15th/16th Street, Balboa Pier, The Wedge, Corona Del Mar State Beach, Little Corona
Beach Miles:	7 miles of coastal beach
Available AB411 BMDs:	1,498 BMDs
Available Yearly BMDs:	2,555 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	8	18	2.2
2001	8	13	0.7
2002	10	17	1.2
2003	14	23	1.4
2004	12	18	1.2

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	15	33	4.7
2001	23	49	3.3
2002	22	64	12.5
2003	31	74	21.4
2004	28	38	8.1

Newport Beach

• CRYSTAL COVE STATE PARK

Sampling Agency:	County of Orange Environmental Health, Orange County Sanitation District
Sampling Frequency:	1 or 5 samples per week (agency dependent)
Sampling Stations:	4
Sampling Locations:	Pelican Point Beach, Crystal Cove Beach, Muddy Creek Beach, El Moro Beach
Beach Miles:	3.2 miles of coastal beach
Available AB411 BMDs:	684.8 BMDs
Available Yearly BMDs:	1,168 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	9	21	1.3
2001	3	5	0.3
2002	1	1	0.1
2003	1	4	0.2
2004	1	2	0.1

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	9	21	1.3
2001	4	7	0.4
2002	3	6	0.3
2003	1	4	0.2
2004	1	2	0.1

El Moro Beach, Crystal Cove State Park

• LAGUNA BEACH

Sampling Agency:	County of Orange Environmental Health, South Orange County Wastewater Authority
Sampling Frequency:	1 or 2 samples per week (agency dependent)
Sampling Stations:	7
Sampling Locations:	Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach, Blue Lagoon
Beach Miles:	4.4 miles of coastal beach
Available AB411 BMDs:	941.6 BMDs
Available Yearly BMDs:	1,606 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	15	34	1.9
2001	5	10	0.6
2002	3	4	0.2
2003	2	4	0.2
2004	4	7	0.6

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	26	65	4.4
2001	14	35	2.1
2002	8	31	1.8
2003	9	26	1.5
2004	11	24	1.9

Cresent Bay, Laguna Beach

• ALISO COUNTY BEACH & SOUTH LAGUNA BEACH

Sampling Agency: South Orange County Wastewater Authority
Sampling Frequency: 2 samples per week
Sampling Stations: 11
Sampling Locations: Treasure Island Pier, Treasure Island Sign, Aliso-North, Aliso-Middle, Aliso Midpoint between Middle & South Stations, Aliso-South, Camel Point, Table Rock, Laguna Lido, 9th Street/1000 Steps Beach, Three Arch Bay
Beach Miles: 2 miles of coastal beach
Available AB411 BMDs: 428 BMDs
Available Yearly BMDs: 730 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	12	22	1.6
2001	4	5	0.7
2002	4	9	1.7
2003	5	9	0.5
2004	4	6	0.6

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	20	37	2.5
2001	10	22	4.5
2002	7	14	2.4
2003	11	21	2.1
2004	6	8	0.8

Aliso County Beach, Laguna Beach

• DANA POINT

Sampling Agency:	County of Orange Environmental Health, South Orange County Wastewater Authority
Sampling Frequency:	1-2 samples per week (agency and season dependent)
Sampling Stations:	5
Sampling Locations:	Monarch Beach - North, Monarch Beach - South, Salt Creek County Beach, Dana Strands, Ocean Institute Beach
Beach Miles:	3 miles of coastal beach
Available AB411 BMDs:	642 BMDs
Available Yearly BMDs:	1,095 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	4	42	2.5
2001	7	13	0.9
2002	10	95	5.5
2003	6	39	2.3
2004	13	108	6.0

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	8	53	3.0
2001	12	31	1.8
2002	11	119	6.9
2003	12	53	3.2
2004	13	113	6.4

Monarch Beach, Dana Point

• DANA POINT HARBOR

Sampling Agency:	County of Orange Environmental Health, South Orange County Wastewater Authority
Sampling Frequency:	1-2 samples per week (agency and season dependent)
Sampling Stations:	12
Sampling Locations:	Fuel Dock, Baby Beach (West End, Buoy Line, Swim Area, East End), Pier, Pilgrim Dock, Youth Dock, Harbor Entrance, Guest Dock, Harbor Patrol Dock, K-O Docks (north side of East Basin)
Beach Miles:	3.3 miles of harbor frontage
Available AB411 BMDs:	706.2 BMDs
Available Yearly BMDs:	1,204.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	10	206	7.9
2001	8	420	20.0
2002	9	410	19.2
2003	8	298	12.3
2004	9	362	18.6

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	12	697	31.2
2001	13	740	32.9
2002	11	719	35.3
2003	9	635	30.8
2004	11	580	30.1

Baby Beach, Dana Point Harbor

• DOHENY STATE BEACH

Sampling Agency:	South Orange County Wastewater Authority, County of Orange Environmental Health
Sampling Frequency:	1-2 samples per week (agency and season dependent)
Sampling Stations:	8
Sampling Locations:	North Beach, 250' North of San Juan Creek, San Juan Creek/Ocean Interface, 250' South of San Juan Creek, 1000' South of Outfall, 2000' South of Outfall, 3000' South of Outfall, 4000' South of Outfall
Beach Miles:	1.1 miles of coastal beach
Available AB411 BMDs:	235.4 BMDs
Available Yearly BMDs:	401.5 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	9	165	140.3
2001	5	191	148.4
2002	7	216	142.5
2003	6	207	116.5
2004	12	226	107.6

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	11	319	293.0
2001	6	368	281.7
2002	7	367	311.8
2003	6	358	243.9
2004	12	334	253.3

Doheny State Beach, Dana Point

• CAPISTRANO COUNTY BEACH

Sampling Agency:	South Orange County Wastewater Authority, County of Orange Environmental Health
Sampling Frequency:	1-2 per week (season dependent)
Sampling Stations:	1
Sampling Locations:	Capistrano County Beach
Beach Miles:	0.25 miles of coastal beach
Available AB411 BMDs:	53.5 BMDs
Available Yearly BMDs:	91.25 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	4	128	12.4
2001	5	98	5.8
2002	7	104	6.2
2003	2	11	2.6
2004	1	2	0.3

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	6	248	24.1
2001	7	238	13.5
2002	8	242	10.3
2003	2	100	24.8
2004	3	94	21.4

Capistrano County Beach, Dana Point

• CAPISTRANO BAY DISTRICT BEACH

Sampling Agency: South Orange County Wastewater Authority, County of Orange Environmental Health
Sampling Frequency: 1-2 samples per week (season dependent)
Sampling Stations: 2
Sampling Locations: 7500' South of Outfall, 10,000' South of Outfall
Beach Miles: 1.6 miles of coastal beach
Available AB411 BMDs: 342.4 BMDs
Available Yearly BMDs: 584 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	2	53	59.6
2001	5	31	4.6
2002	6	77	97.9
2003	5	25	18.4
2004	3	4	1.7

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	7	107	111.9
2001	7	131	201.6
2002	10	181	201.9
2003	5	100	138.5
2004	5	84	129.8

Capistrano Bay District Beach, Dana Point

• POCHE BEACH

Sampling Agency: South Orange County Wastewater Authority, County of Orange Environmental Health
Sampling Frequency: 1-2 samples per week (season dependent)
Sampling Stations: 1
Sampling Locations: Poche Beach
Beach Miles: 0.2 miles of coastal beach
Available AB411 BMDs: 42.8 BMDs
Available Yearly BMDs: 73 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	3	104	5.7
2001	3	145	19.8
2002	4	153	18.8
2003	7	88	11.0
2004	7	160	12.4

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	5	163	9.2
2001	3	298	33.7
2002	6	222	29.7
2003	8	171	25.4
2004	8	221	18.2

Poche Beach, San Clemente

• SAN CLEMENTE CITY & STATE BEACH

Sampling Agency:	South Orange County Wastewater Authority, County of Orange Environmental Health
Sampling Frequency:	1-2 samples per week (season dependent)
Sampling Stations:	5
Sampling Locations:	North Beach, 450 Feet North of Pier, Trafalgar Street (“T” Street), Avenida Calafia, Avenida de Las Palmeras
Beach Miles:	3.2 miles of coastal beach
Available AB411 BMDs:	299.6 BMDs
Available Yearly BMDs:	511 BMDs

AB 411 PERIOD (APRIL – OCTOBER)

Year	Postings	Days	Beach Mile Days
2000	5	13	3.9
2001	4	13	3.8
2002	6	10	0.6
2003	4	7	0.6
2004	2	5	0.3

CALENDAR YEAR

Year	Postings	Days	Beach Mile Days
2000	9	25	5.1
2001	5	17	4.1
2002	14	147	16.2
2003	12	145	8.6
2004	4	10	0.6

San Clemente City Pier

APPENDIX 2

Unauthorized Discharges of Waste and Ocean and Bay Water Closures 1987 – 2004

The following chart, arranged by year, details the total number of unauthorized discharges of waste reported to the Health Care Agency and total number of ocean and bay water closures from 1987 – 2004. For the total number of unauthorized discharges of waste reported, the chart categorizes waste discharges by sewage type and by waste discharge causes for each year. For the total number of ocean and bay water closures, the chart categorizes by waste type and closure causes. In addition, the total number of Beach Mile Days for ocean and bay water closures from sewage spills and from miscellaneous causes is shown from 1999 – 2004.

Sewage Overflowing from a Manhole

Number of Unauthorized Discharges of Waste / Ocean and Bay Water Closures in Orange County 1987 – 2004

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
WASTE DISCHARGES																		
Total Number of Discharges	63	83	59	76	101	118	97	125	120	170	226	252	276	377	412	522	534	496
By Waste Type																		
Raw Sewage	60	83	58	70	96	108	91	112	111	117	142	205	236	331	378	404	392	362
Primary Treated Effluent	0	0	1	0	0	0	1	1	0	1	1	0	0	1	0	0	0	2
Secondary Treated Effluent	0	0	0	3	3	5	0	2	3	1	10	12	2	6	9	3	6	10
Tertiary Treated Effluent	0	0	0	1	1	4	3	5	5	47	68	28	31	37	25	114	135	122
Miscellaneous	3	0	0	2	1	1	2	5	1	4	5	7	7	2	0	1	1	0
Waste Discharge Causes																		
Pipeline Breaks	16	12	13	25	11	17	21	18	20	57	61	60	38	51	60	92	133	114
Pipeline Blockages	26	42	32	34	72	86	61	89	72	65	118	139	210	288	308	409	358	329
Pump Station Failures	14	26	13	12	12	6	9	9	8	24	15	16	14	8	15	11	17	12
Treatment Plant Discharges	0	1	0	2	2	3	0	2	3	1	1	2	0	0	4	2	4	9
Stormwater Surcharges	0	0	0	0	0	1	2	0	10	0	4	14	0	1	0	3	6	2
Vessel Pump Station Failures	0	0	0	0	0	0	1	0	0	1	0	0	0	4	9	3	6	9
Miscellaneous	7	2	1	3	4	5	3	7	7	22	27	21	14	25	16	2	10	21
OCEAN AND BAY WATER CLOSURES																		
Total Number of Closures	8	12	11	10	15	15	7	17	22	21	17	35	22	40	51	38	27	30
By Waste Type																		
Raw Sewage	8	12	11	10	14	13	7	13	21	20	16	30	19	38	49	37	27	29
Primary Treated Effluent	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1
Secondary Treated Effluent	0	0	0	0	0	2	0	0	0	0	0	1	1	2	2	0	0	0
Tertiary Treated Effluent	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0
Miscellaneous	0	0	0	0	1	0	0	2	1	1	0	2	2	0	0	1	0	0
Ocean and Bay Water Closure Causes																		
Pipeline Breaks	2	2	5	3	2	5	2	7	6	2	4	18	2	4	6	2	2	3
Pipeline Blockages	3	3	1	5	9	7	2	8	10	8	8	4	11	30	29	31	17	13
Pump Station Failures	3	6	5	1	3	1	1	0	3	7	4	3	5	2	6	1	1	0
Treatment Plant Discharges	0	1	0	0	0	0	0	2	0	0	0	0	1	0	1	0	0	1
Stormwater Surcharges	0	0	0	0	0	1	1	0	2	1	1	5	0	0	0	0	0	0
Vessel Pump Station Failures	0	0	0	0	0	0	1	0	0	1	0	0	0	4	9	3	6	9
Miscellaneous	0	0	0	1	1	1	0	0	1	2	0	5	3	0	0	0	1	4
Beach Mile Days of Closures																		
Due to Sewage Spills	~	~	~	~	~	~	~	~	~	~	~	~	51.0	54.4	53.1	18.4	15.1	13.9
Due to Miscellaneous Causes	~	~	~	~	~	~	~	~	~	~	~	~	105.1	0.0	0.0	11.3	0.0	0.0

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