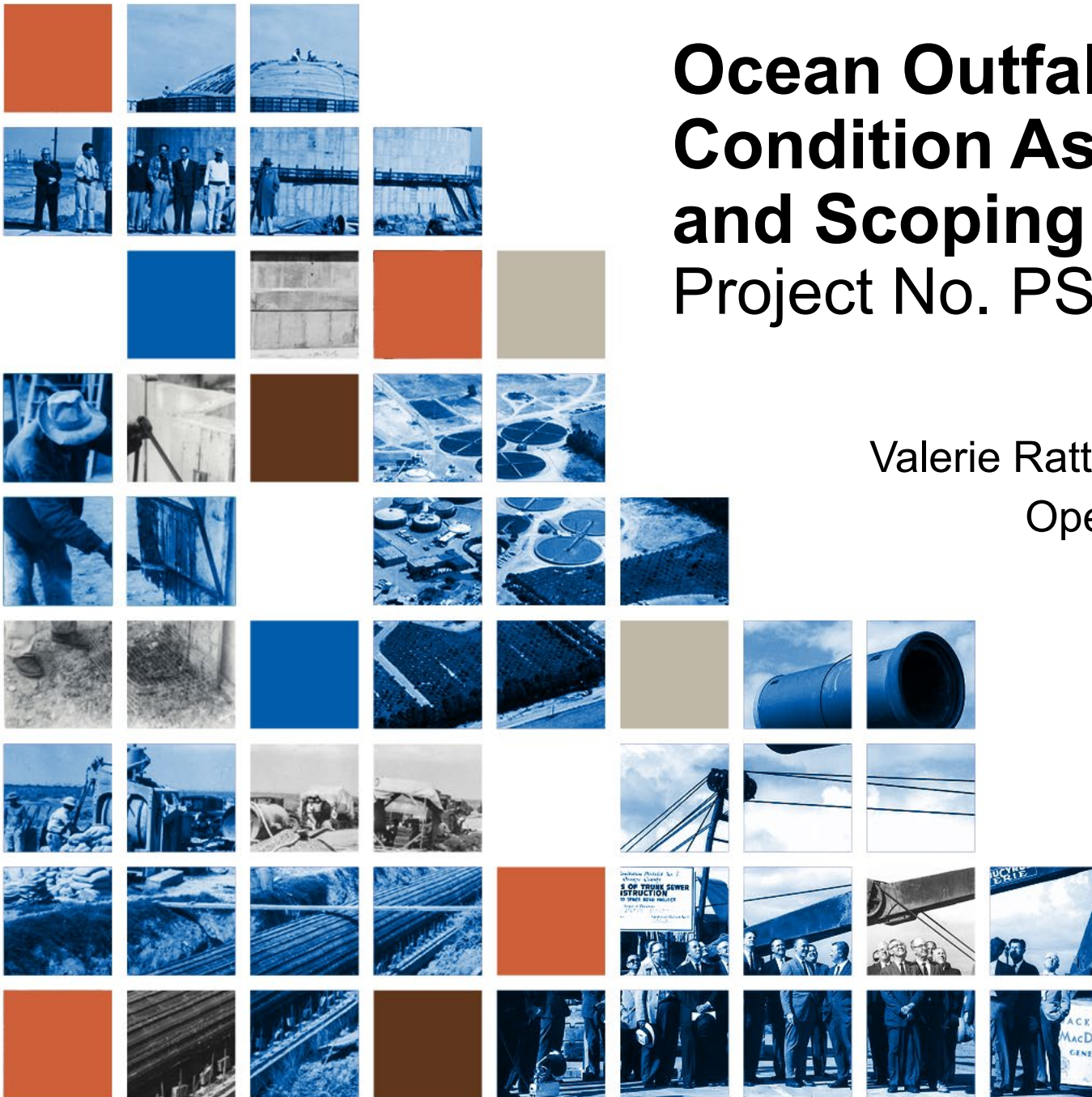


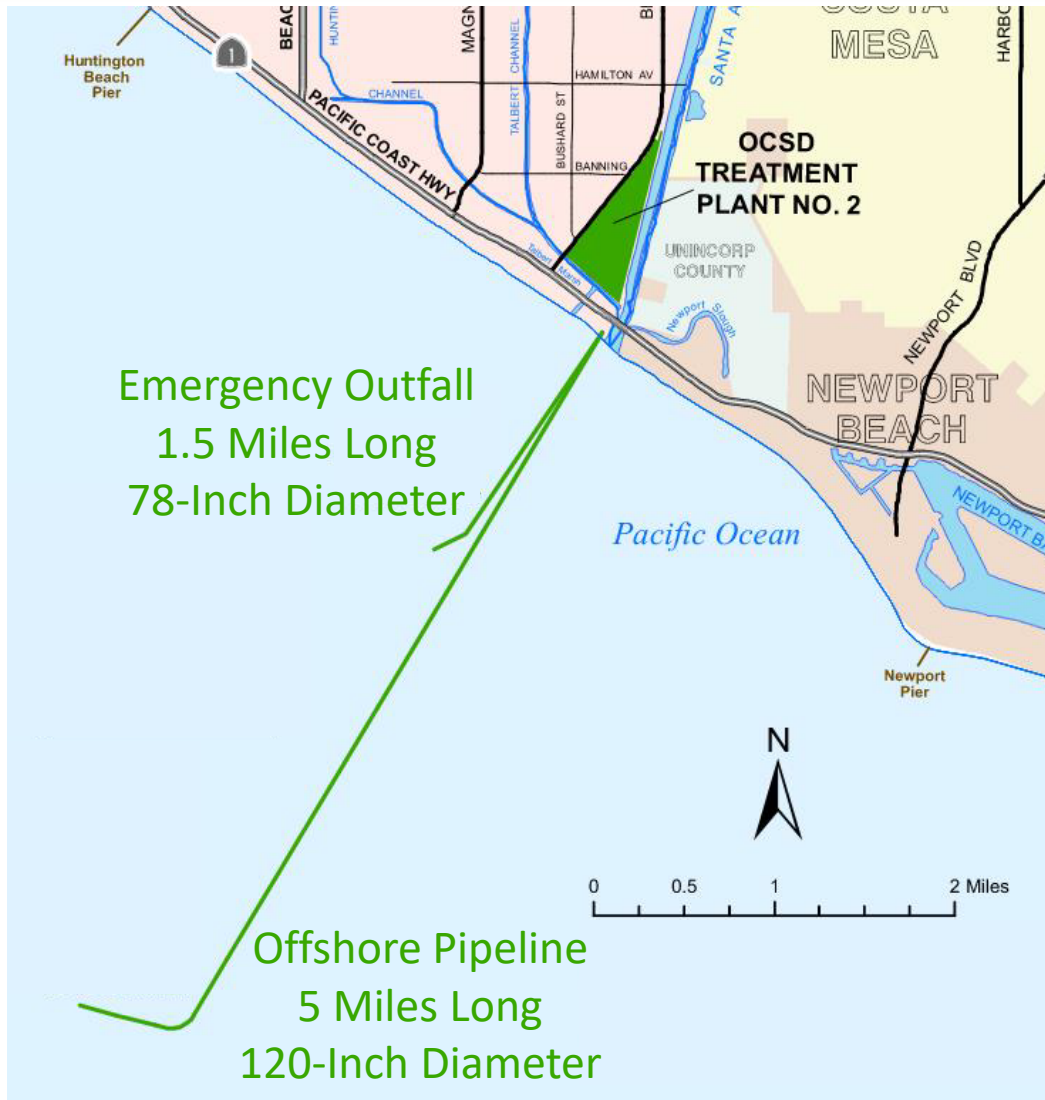
# Ocean Outfall Condition Assessment and Scoping Study

## Project No. PS18-09

Valerie Ratto, Project Manager  
Operations Committee  
March 4, 2020



# Ocean Outfall



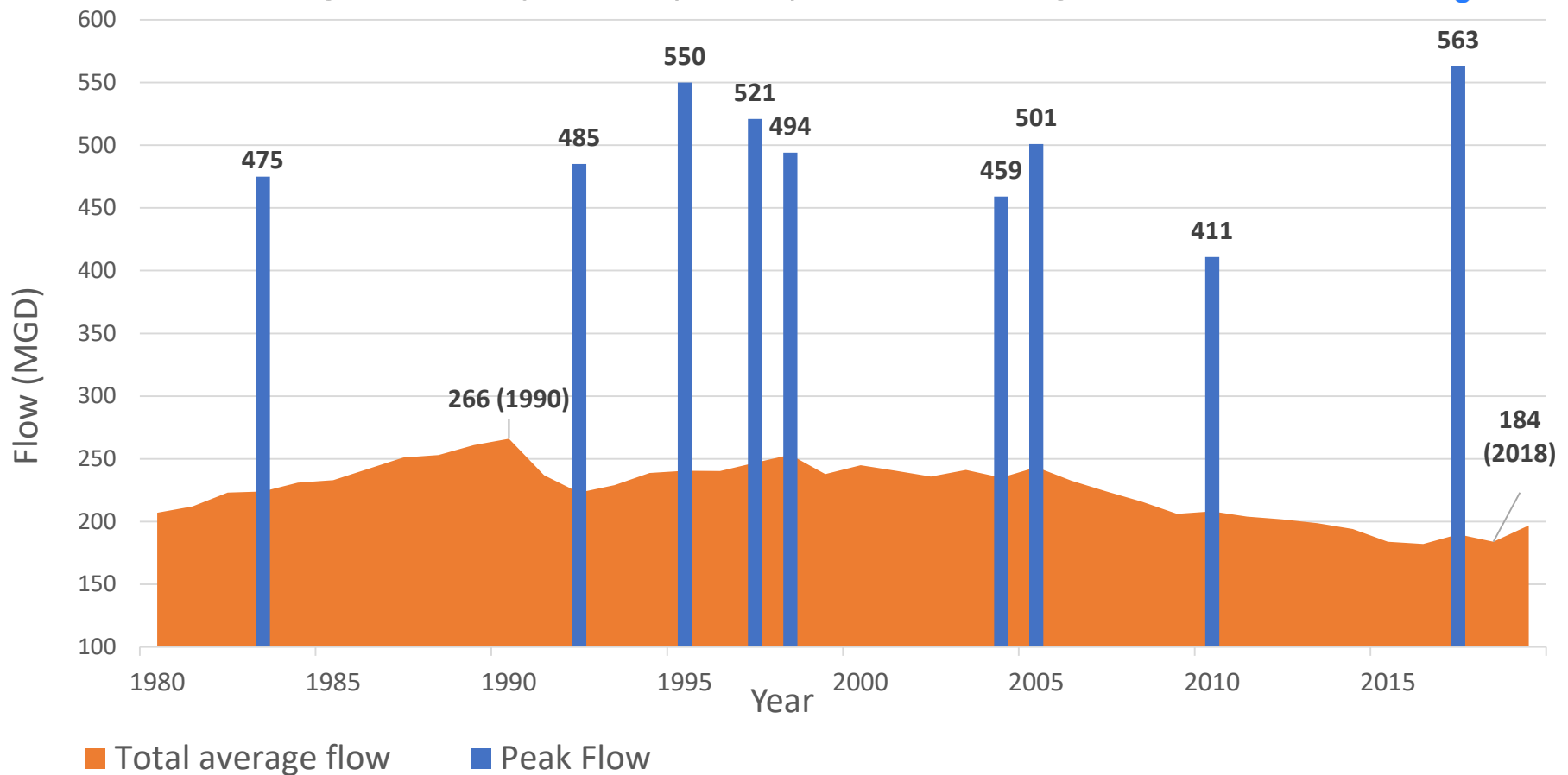
Emergency Outfall  
1.5 Miles Long  
78-Inch Diameter

Offshore Pipeline  
5 Miles Long  
120-Inch Diameter

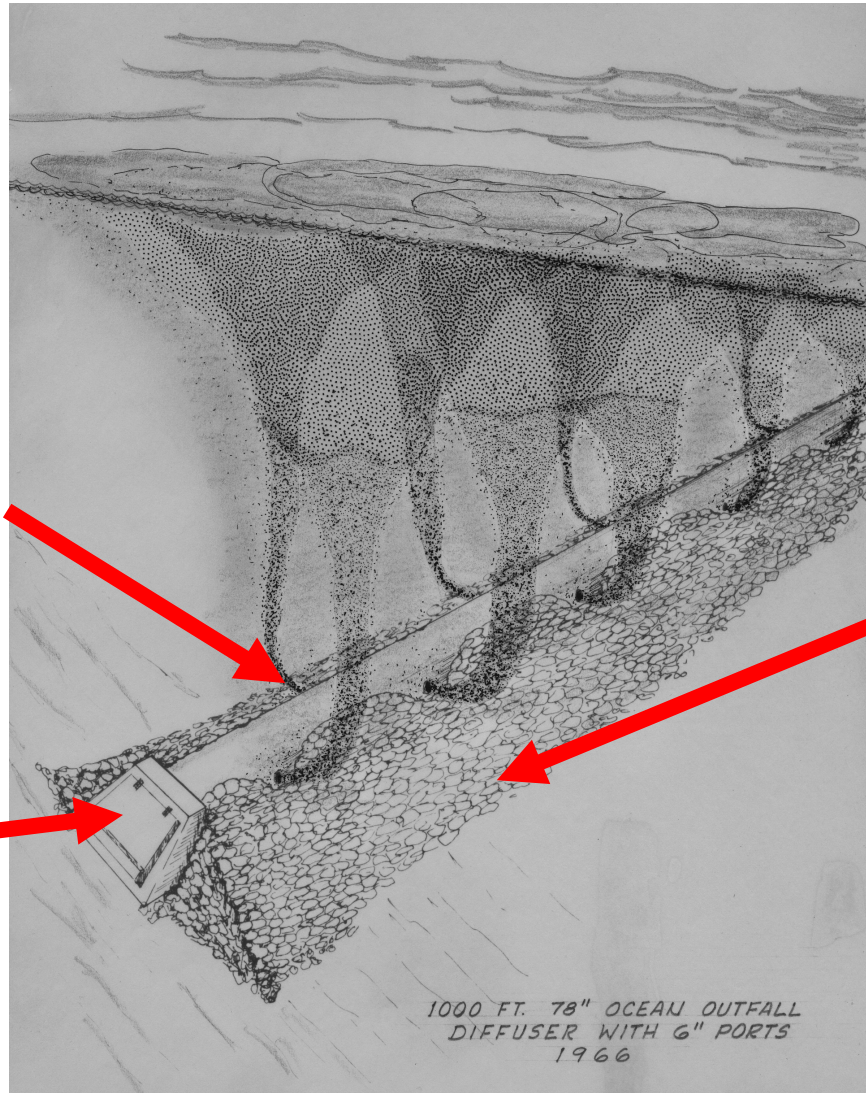
# Extreme Flow Events



## Average Monthly Flow (MGD) vs. Peak High Flow Events



# Outfall Design



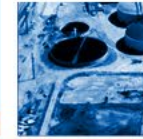
Diffuser Ports

Ballast

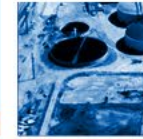
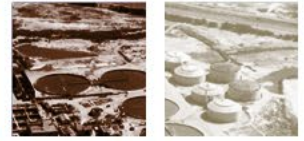
End Structure

1000 FT. 78" OCEAN OUTFALL  
DIFFUSER WITH 6" PORTS  
1966

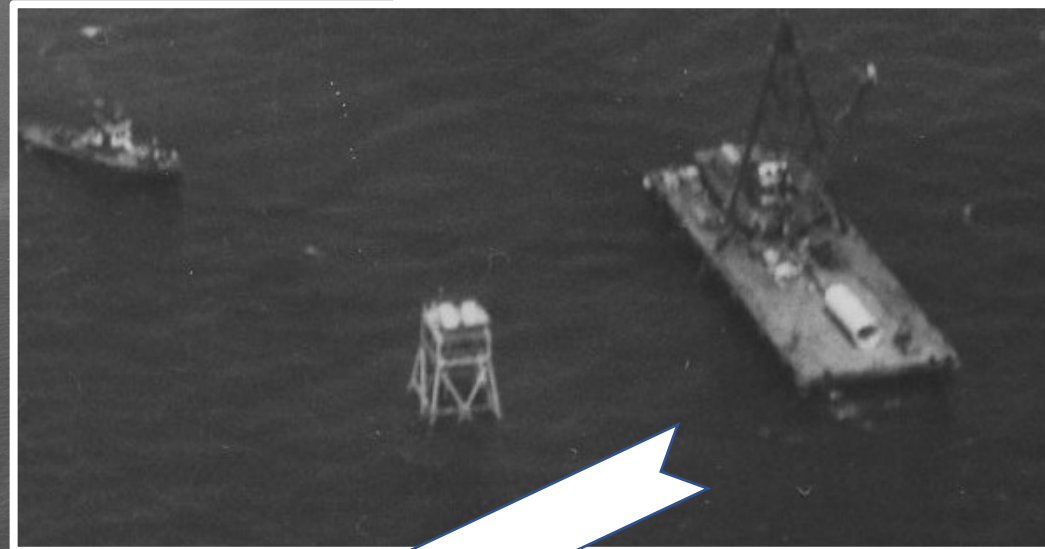
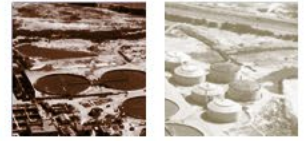
# Outfall Construction



# Outfall Construction



# Outfall Construction



# 1968-1970

## Ocean Outfall Job Cost \$8,948,000

### CONTROVERSIAL CONTRACT LET; 2-YEAR COMPLETION

FOUNTAIN VALLEY—Directors of District 1 of the county sanitation districts Monday awarded a \$8,948,000 contract to Peter Kiewit Sons, Inc., of Richmond for construction of an ocean outfall at the mouth of the Santa Ana River.

Directors also approved extension of the contract date to Jan. 16, when construction is scheduled to begin.

The Water Pollution Control Administration the Department pay \$3,374,580

remainder will be financed proportionately by taxpayers in Districts 1, 2, 3, 5, 6, 7 and 11.

District 1 was named as agent for the other six. Directors pre-

remembered to enclose a certified check.

At a special meeting Oct. 16 Nissen said the districts are not obligated to award any bid on

An attorney for Healy, Ryan asked that the firm be given the bid or that all bids be rejected and the project readvertised.

The joint board, however,

## King-Size Plumbing Job Under Way

By BRUCE TAYLOR  
Register Staff Writer

Three miles offshore from the mouth of Santa Ana River, men and machines are struggling to complete the most tedious, if not the biggest, plumbing job in Orange County history.

Mammoth sections of concrete pipe are being fitted together on the ocean floor 70 feet deep.

Rugged men suited in red safety vests and bright yellow hard hats each day manipulate the 65-ton pipe sections from the deck of a converted World War II Liberty Ship into the water.

On the ocean floor, the 10-foot diameter pipe sections must be fitted end to end in a

line five miles long before the job is completed next spring.

The Liberty Ship, the Davy Crockett, was converted for laying pipe last year in Richmond, Va. The vessel is 440 feet long and its crane reaches 100 feet above deck level. It has the largest pipe-laying ocean platform in the world.

No longer self-powered, the Davy Crockett is moved by a system of cables attached to six 4-ton anchors on the ocean bottom.

The ship and men work for Peter Kewitt and Sons, the prime contracting company to the Orange County Sanitation District. The firm is laying the \$10 million ocean outfall system which will replace the existing one now discharging

effluent one mile offshore. Final sections of the 10-foot-diameter pipe line will be lowered 198 feet below the ocean surface.

Work began on the huge pipe line project in January 1969. Completion is expected early next spring.

Workmen assemble at a break on the long trestle where they board a tug boat which delivers them to the side of the Davy Crockett. There, they climb iron runways on the ship's side to the deck where they disburse to take up work positions.

Ideal conditions seldom exist on the open ocean. The 22-month history of the pipe laying project has been plagued by high seas, wind

and rain. The Davy Crockett almost was blown to shore

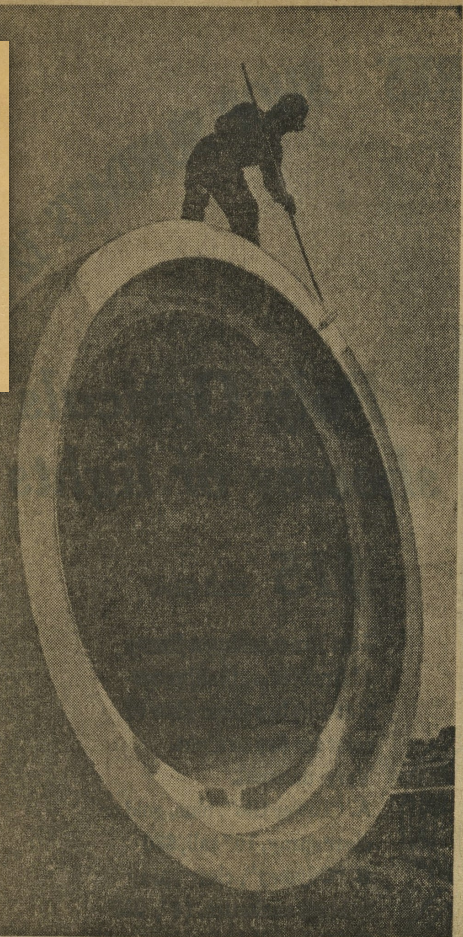
Part II-Thurs., Dec. 17, 1970 R Los Angeles Times ★

The REGISTER Sunday, November 1, 1970 D1

# The Register

## 'Sewer To The Sea' Labeled As 'Enhancing' OC's Water

FOUNTAIN VALLEY—Directors of District 1 of the county sanitation districts Monday awarded a \$8,948,000 contract to Peter Kiewit Sons, Inc., of Richmond for construction of an ocean outfall at the mouth of the Santa Ana River.



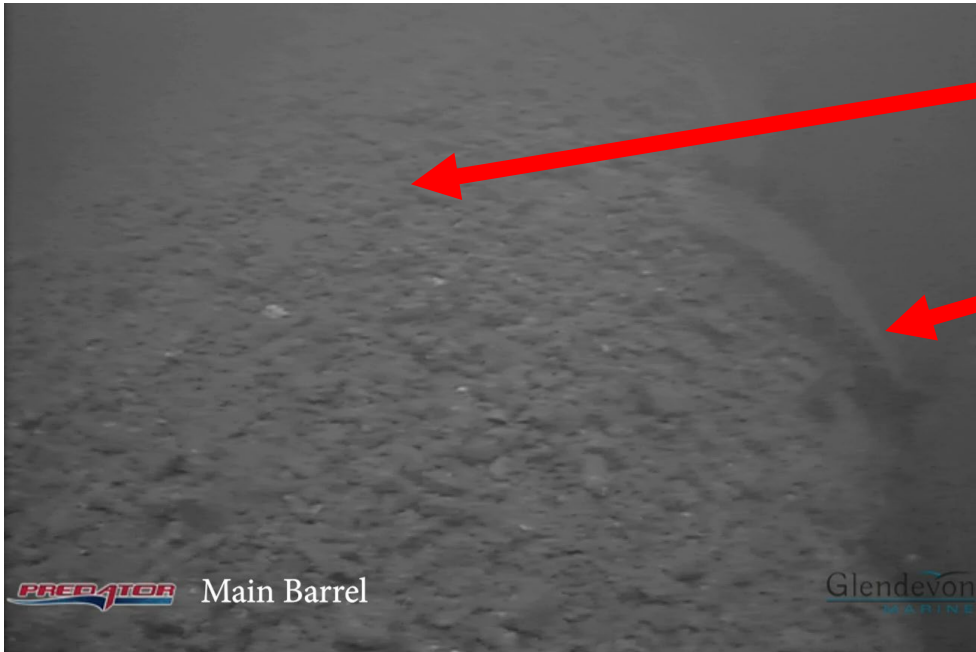
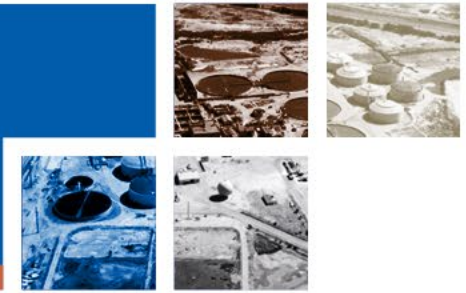
MONSTER OF DEEP—Ron Capps applies paint to 108-inch ocean outfall section so divers joining sections 190 feet below surface can see them more easily. Times photo by Maxine Reams



65-TON PIPE SECTIONS LINE DECK OF WORKSHIP DAVEY CROCKET



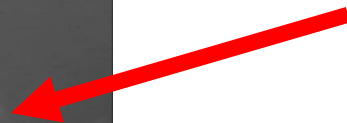
# Outfall in Tidal Zone



Ballast



Pipe Joint



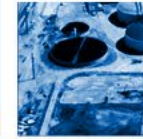
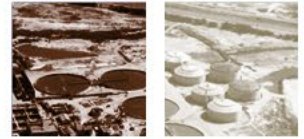
Ballast



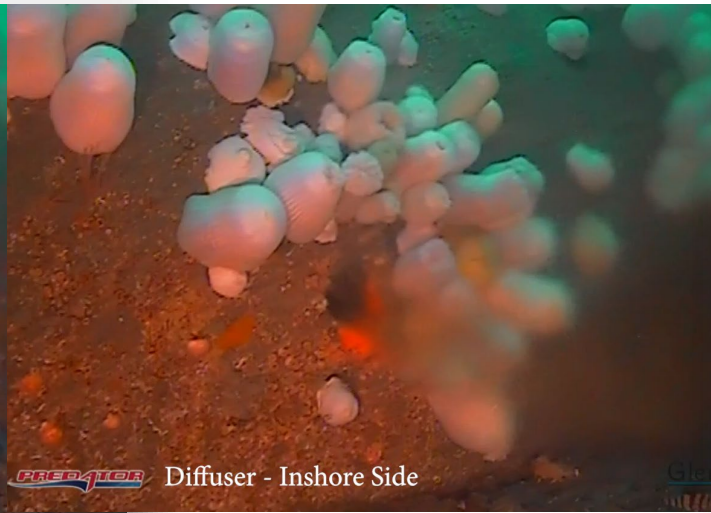
Manhole



# Diffuser Ports



Diffuser - Inshore Side



Diffuser - Inshore Side



Diffuser - Inshore Side



Diffuser - Offshore Side

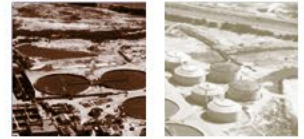


Diffuser - Offshore Side

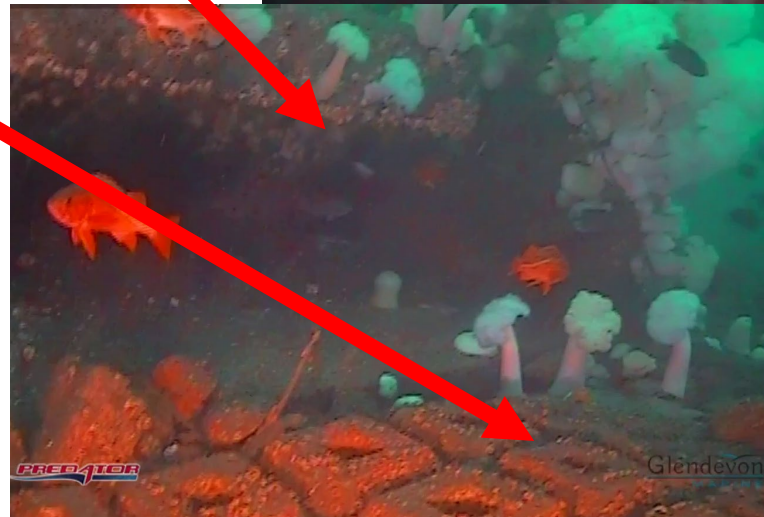
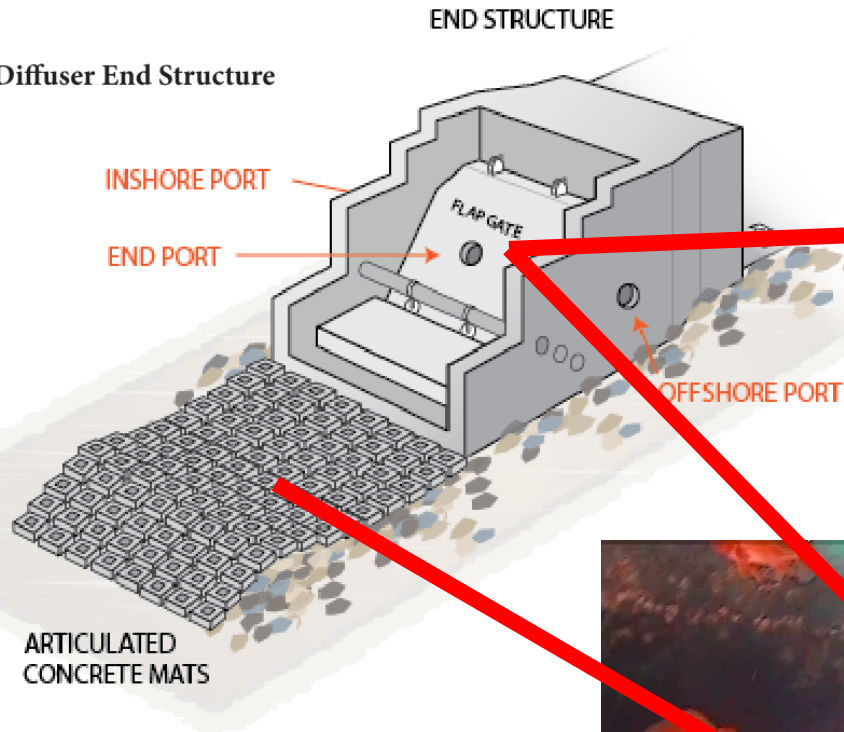


Diffuser - Offshore Side

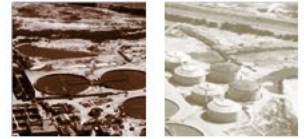
# End Structure



120" Outfall Diffuser End Structure



# Hardware



Monel Fasteners

Cast Iron  
Manhole Cover



Monel Tiebar

# Project Elements

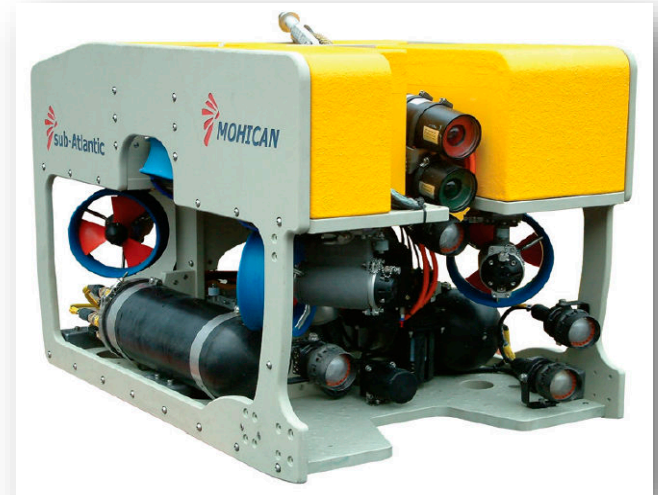


- Condition Assessment
- Port Cleaning and Clearing
- 3D Scanning and Modeling
- Impacts of Low Flows

# Project Elements



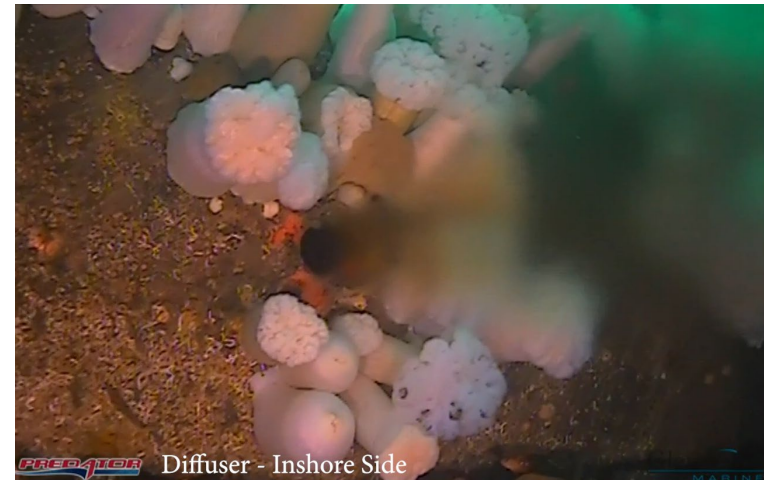
- **Condition Assessment**
- Port Cleaning and Clearing
- 3D Scanning and Modeling
- Impacts of Low Flows



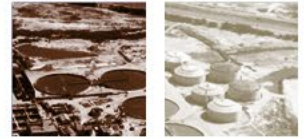
# Project Elements



- Condition Assessment
- **Port Cleaning and Clearing**
- 3D Scanning and Modeling
- Impacts of Low Flows



# Project Elements

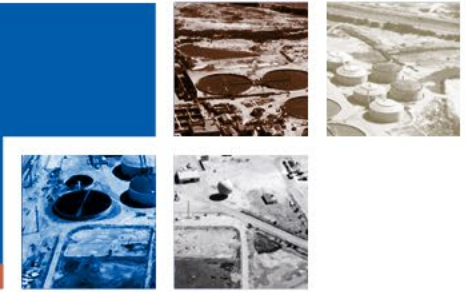


- Condition Assessment
- Port Cleaning and Clearing
- **3D Scanning and Modeling**
- Impacts of Low Flows

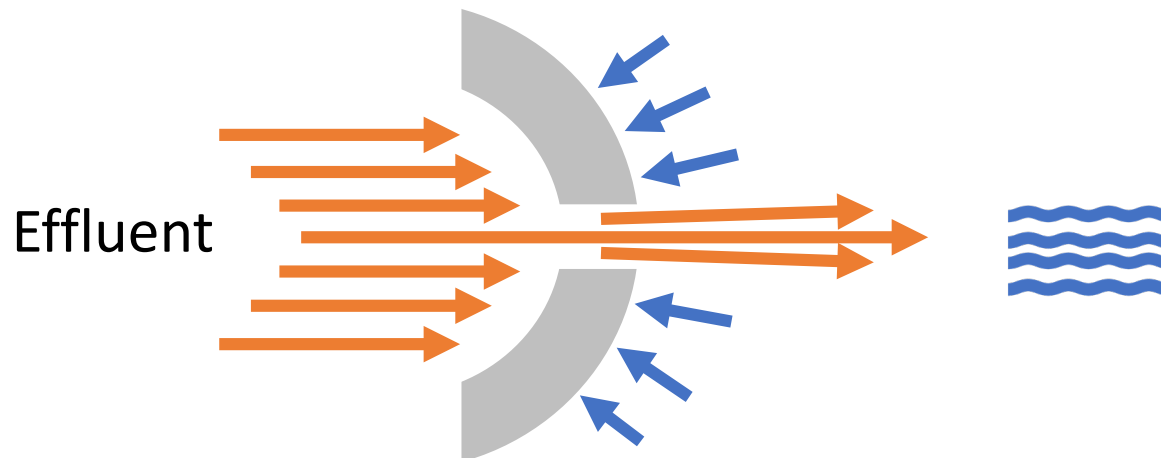




# Project Elements



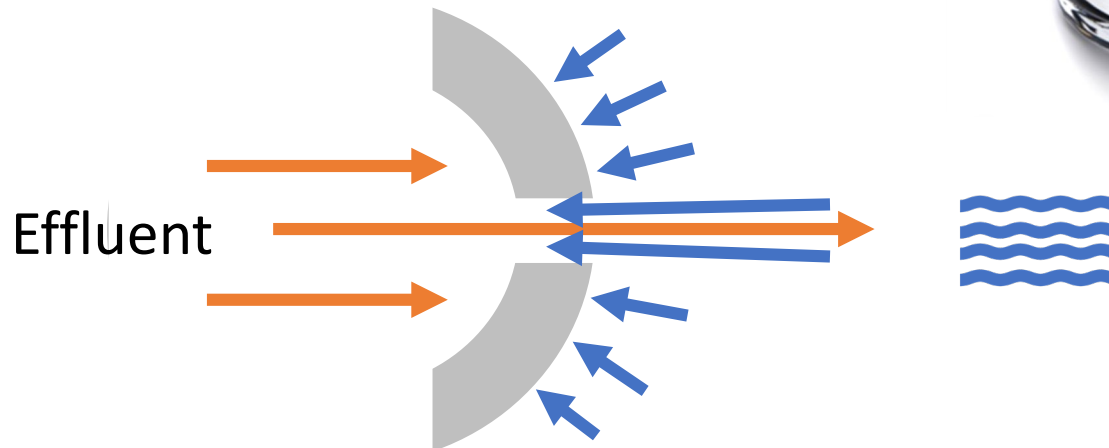
- Condition Assessment
- Port Cleaning and Clearing
- 3D Scanning and Modeling
- **Impacts of Low Flows**



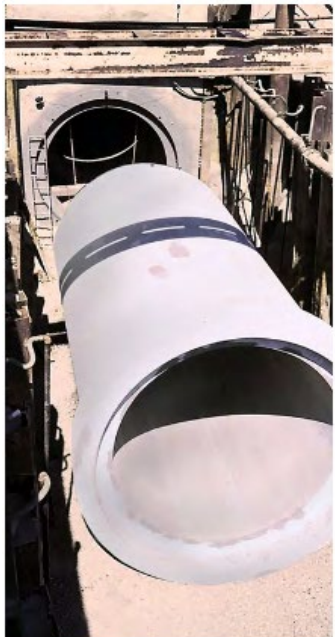
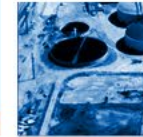
# Project Elements



- Condition Assessment
- Port Cleaning and Clearing
- 3D Scanning and Modeling
- **Impacts of Low Flows**



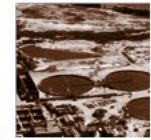
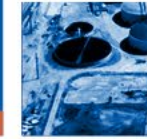
# Selection Process



- Two proposals received
- Interviews conducted with both firms
- Carollo Engineers Selected



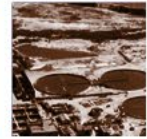
# Negotiations



	Original Proposal	Negotiated
Total Hours	8,302	8,042
Total Fee	\$3,139,295	\$2,744,000

- Reduced resolution for 3D Model
- More detailed low-flow modeling
- Eliminated interior sampling
- Revised testing requirements

# Fee Breakdown



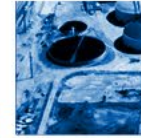
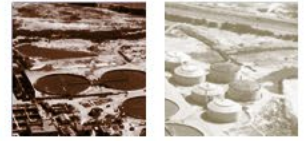
Item	Budget
Prime Consultant	\$950,000
Other Subconsultants	\$140,000
Exterior Inspection (Divers) – 57 Days	\$420,000
Interior Inspection (Remote Vehicle)	\$400,000
Port Cleaning (Remote Vehicle)	\$330,000
3D Scanning and Modeling (Submersible)	\$500,000

# Recommendation



- Approve a Professional Services Agreement with Carollo Engineers, Inc. to provide engineering services for the Ocean Outfall Condition Assessment and Scoping Study, Project No. PS18-09, for an amount not to exceed \$2,744,000; and
- Approve a contingency of \$274,400 (10%).

# Questions



MakeAGIF.com