



## CITY COUNCIL AGENDA REPORT

DATE: December 2, 2015

AGENDA OF: December 8, 2015

DEPARTMENT: City Manager

SUBJECT: Cowell Beach Water Quality Working Group Findings and Recommendations (CM)

---

RECOMMENDATION: Receive the Cowell Beach Water Quality Working Group final report and provide direction to staff as appropriate.

---

BACKGROUND: The following is the final report from the Cowell Beach Water Quality Working Group.

### **Introduction**

Cowell Beach is nestled at the heart of the City of Santa Cruz' Coastline and is a cherished natural resource for its residents and thousands of annual visitors. Being home to one of the world's premier longboard surf breaks, Cowell Beach is where many of California's top surfers initially honed their skills. The Beach serves as a chief economic driver for the region, as it hosts weddings, triathlons and cultural events and routinely serves as the backdrop for marketing material sent across the globe. Finally, Cowell Beach is home to the original O'Neill surf shop, which recently received a California State historic point of interest designation.

While Cowell Beach is rich in cultural, historical and economic value, in recent years it has taken on the dubious distinction of being the "dirtiest beach" in California.

### **Brief History of the Issue**

Cowell Beach water quality has been compromised by high bacteria counts (fecal coliform and enterococcus) for some time, consistently landing it on Heal the Bay's "Beach Bummer" list in recent years<sup>1</sup>. Heal the Bay's annual scorecard report, which reviews beach water quality up and down the California coastline, has assigned Cowell Beach the most polluted beach in California for 2014 and 2015. Cowell receives this undesirable moniker in spite of the community's dedication to environmental sustainability and the City's decade-long effort to improve water quality there.

#### ***Stanford Study:***

Conducted by Dr. Ali Boehm in 2012, the Stanford study used spatial and temporal

---

<sup>1</sup> <http://www.healthebay.org/beach-report-card>

sampling coupled with process modeling to investigate potential fecal indicator bacteria (FIB) sources and the relative contributions of those sources.<sup>2</sup> Temporal sampling showed consistently high FIB concentrations in the surf zone, sand and wrack (kelp) at Cowell Beach and ruled out storm drains, the river, the harbor and the adjacent wharf infrastructure as the sources of the high concentrations observed in the surf zone. The conclusions of the study pointed two likely sources: human-influenced bacteria likely stemming from discharge from Neary Lagoon and avian-influenced bacteria possibly related to the wharf. It was found that FIB from wrack represented a minor contribution to bacterial levels in the water, and molecular source tracking methods indicated the FIB at the beach were likely of human and bird origin.

### ***City Infrastructure Improvements:***

The City responded with several infrastructure improvements. Most important was the discovery and correction of a severely faulty private sewer lateral. The City also made several modifications to the Neary Lagoon storm drain system, which now allows the City to properly clean the large drainage pipes that connect Neary Lagoon to Cowell. The City has also increased maintenance efforts directly on the beach with increase raking of the beach and with a higher security presence in the adjacent areas to reduce the possibility of direct human impacts to the beach.

### ***World Surfing Reserve Summit:***

In response to the continued water quality issues at Cowell, a group of concerned surfing and local environmentalists identified the improvement of Cowell Beach water quality as a top priority for the Santa Cruz World Surfing Reserve. The World Surfing Reserves program is a global network of protected areas that enshrines unique coastal environments and builds capacity with local partners for long-term conservation.<sup>3</sup> The network includes sites in Malibu, Portugal, Australia, Peru, Chile, Mexico---and Santa Cruz, which was dedicated in 2012 as the fourth World Surfing Reserve. In 2014, Save The Waves Coalition, along with community partners, held a summit to prioritize threats to the Santa Cruz coast, identify current conservation activities, identify gaps in current actions and build a concrete conservation plan identifying strategies and actions.<sup>4</sup> As an outcome of this community planning process, the Coalition developed an initial set of recommendations to bring to City Council for consideration. Their list included the recommendation to activate a formal group, with City participation, to help rectify water quality issues at Cowell.

## **Cowell Beach Water Quality Working Group (CWG)**

In September 2014, City Council officially created the Cowell Beach Water Quality Working Group (CWG) to explore the Cowell water quality issues and review the group's existing list of recommendations over a period of up to twelve months along with City staff assistance. Council tasked the CWG with reviewing City research, monitoring and mitigation efforts to date, evaluating the group's recommendations and other solutions, engaging and educating the community and seeking external funding opportunities. The group was ultimately responsible for preparing a report with findings and recommendations for City Council consideration within

---

<sup>2</sup>[http://www.waterboards.ca.gov/water\\_issues/programs/beaches/cbi\\_projects/docs/tsr/10430550\\_cowell.pdf](http://www.waterboards.ca.gov/water_issues/programs/beaches/cbi_projects/docs/tsr/10430550_cowell.pdf)

<sup>3</sup> <http://www.savethewaves.org/programs/world-surfing-reserves/>

<sup>4</sup> [http://www.savethewaves.org/wp-content/uploads/SCWSR\\_Stewardship-Plan-Draft.pdf](http://www.savethewaves.org/wp-content/uploads/SCWSR_Stewardship-Plan-Draft.pdf)

12 months. Anticipating that the CWG would need more time to complete its work, City Council subsequently extended the CWG deadline through November 2015.

The group has met monthly since its initial October 2014 meeting. The CWG is facilitated and led by Save The Waves Coalition, and includes representatives from the Coastal Watershed Council, Surfrider Foundation Santa Cruz, Sierra Club and the City of Santa Cruz and County of Santa Cruz.

## **Goals and Objectives**

In order to effectively organize its work and develop meaningful recommendations, the CWG first discussed, and coalesced around, the following three goal areas:

1. Reduce bacteria counts at Cowell Beach through policy and stewardship actions
2. Increase public understanding of Cowell's Beach issue
3. Improve scientific understanding of Cowell's Beach issue

The CWG unanimously supported these goals as they align closely with the City Council's direction and concerns from the public.

Improving conditions at Cowell is the chief concern of Councilmembers and members of the CWG as it relates to the work of the group. In particular, the CWG seeks to eliminate all human-derived sources of bacteria capable of causing human illness and reduce naturally occurring sources of bacteria to the maximum extent practicable. The goal includes review and pursuit of potential policy changes and actions that will have a demonstrable positive impact on bacteria levels, and thereby, removal of Cowell from the Beach Bummer list.

Secondarily, the science and data around the bacteria sources at Cowell Beach need to be reviewed from a technical standpoint and comprehensively integrated to produce the clarity and basic understanding of the issue for all environmental and regulatory stakeholders. There have been some controversies arising from findings in previous studies, in terms of likely source of contaminants. These disagreements are attributable to methods and language used with the data interpretation. This has left an inchoate picture of the causes of the high bacteria profile. Adding to this profile is the apparent lack of correlation of high bacteria readings with any health-related issues with the beachgoers. All these studies and data indicate the need for a more comprehensive analysis of the data along the entire stretch of Cowell Beach. Therefore, an important goal area is to accurately define the scope of the problem, develop consensus on the likely sources and monitoring protocols, as well as further develop strategies to fill the current gaps in our knowledge. By integrating and reviewing data with multiple sources, we will improve understanding of the condition (causes and severity), and ultimately help the City and other partners implement more effective interventions to improve conditions at Cowell Beach.

Finally, it is critical to educate the public about the potential sources of bacteria and the true risks of exposure to illness. There is significant misunderstanding about the scale and nature of the water quality problem amongst the general public. For instance, members of the public continue to believe that the City's Wastewater Plant is connected to the issue, even though it is completely sealed off from Neary Lagoon (the tributary near Cowell Beach) and routinely monitored. The facility has won awards for its outstanding environmental practices and Environmental Protection Agency (EPA) compliance. Exacerbating these misconceptions are some scientific

anomalies surrounding the spot such as: the concentration of bacteria is higher in the summer than the winter (most beaches experience the opposite phenomenon), and bacteria counts are high, while numbers of reported instances of illness are exceptionally low. CWG felt it is critical to provide the known facts of the conditions to community, both the understood and hypothesized causes of those conditions, and to ensure that information is shared in as broad and simple format as possible. Additionally, information should be provided to the community more frequently, so as not to only coincide with the release of the annual Heal the Bay report (and its Beach Bummer list).

Taken together, the three goal areas serve to better inform the public and the City Council in terms of understanding the problem more comprehensively and ultimately assist the City in instituting effective solutions.

Following the goal setting exercise, the CWG met monthly to review data, discuss opportunities to improve the scientific understanding of Cowell water quality, and deliberate on potential solutions. These conversations were robust given the experience and expertise in the room, with scientists, surfers, environmentalists, and regulators, as well as staff from the City and the County who implement measures and have an intimate understanding of the dynamics at Cowell.

**DISCUSSION:** The next section includes a summary of the CWG's accomplishments, findings, recommendations and suggested next steps.

## **CWG Accomplishments**

To date, the CWG has launched several measures including the establishment of a new monitoring site in an effort to better characterize the distribution of the impairment on the beach. In addition, the group regularly shares and reviews data across its member agencies.

### ***Created New Monitoring Site:***

This new monitoring site captures weekly water samples in the surfing line-up, which provide a new data set in evaluating the extent of water quality concerns to the surfing community and other ocean user groups. Surfrider Foundation Santa Cruz Chapter, with help and support from Save The Waves, has been conducting the weekly water samples since December 2014.

### ***Implemented New Testing, Data Sharing and Conclusions:***

The Cowell Working Group has overlaid all of the available data and scientific research focused on Cowell water quality to optimize its shared understanding of the bacteria sources. For the first time the non-profit sector, the County and the City are routinely sharing data sets. The available data shows that much of the issue is geographically located directly under and adjacent to the wharf. The concentration dissipates the further one moves from the wharf in either direction. While the County routinely tests 25 yards west of the Wharf for compliance with AB 411, new preliminary data taken during the most recent dry season indicate that the highest bacteria concentrations seem to be located directly under the Wharf (see Graph 1 and 2).

### ***Increased Public Outreach and Communication:***

Since, August of 2015, the CWG meetings have been open to the public with private citizens routinely participating. On behalf of the group, Save The Waves has held several press

conferences, released periodic press release updates, created a website, and is planning a community outreach meeting. Additionally, Heal the Bay, the nonprofit organization that releases the annual report card for beach water quality, has engaged with the CWG in its efforts to better understand Cowell's water quality issues. Heal the Bay acknowledged the Santa Cruz Working Group's efforts as exemplary in its 2015 annual report. In recognition of the data monitoring efforts and public works projects to source and abate the bacteria counts, they added qualifying language to Cowell Beach grade in the report card.

***Increased Community and Financial Support:***

Save The Waves recently received a matching grant from the Community Foundation to continue the work of the CWG in 2016. As the CWG is not a standing City Council committee, it is recommended that the CWG convene outside the City and be hosted by the Save The Waves organization, with city staff and partner organizations continuing to participate.

**CWG Findings and Actions**

Cowell Beach has been on Heal the Bay's Beach Bummer top 10 list for the last six years. Understanding the need to improve conditions, the City has responded in numerous ways: repairing adjacent City infrastructure and monitoring and repair of private sewer laterals to prevent any human contribution to the bacteria levels, hiring outside experts to study the conditions, coordinating testing with the County and instituting several beach cleanup measures.

This work done to date helped inform the CWG discussion throughout its deliberations. Below is a summary of major findings from the City's work and the work of the CWG, which serves as a basis for the CWG's recommendations.

***Conclusions from Surf Line-up data:***

As part of the CWG's initial actions, it established an additional monitoring point in the surfing line-up (where surfers take off on breaking waves) to determine if elevated concentration of bacteria are present where the majority of water users are located. Surfrider staff and volunteers collected data from this point with regularity (more or less weekly basis). The data largely demonstrated that the elevated bacteria levels (enterococcus and E.coli) were substantially less than concentrations present near the wharf.

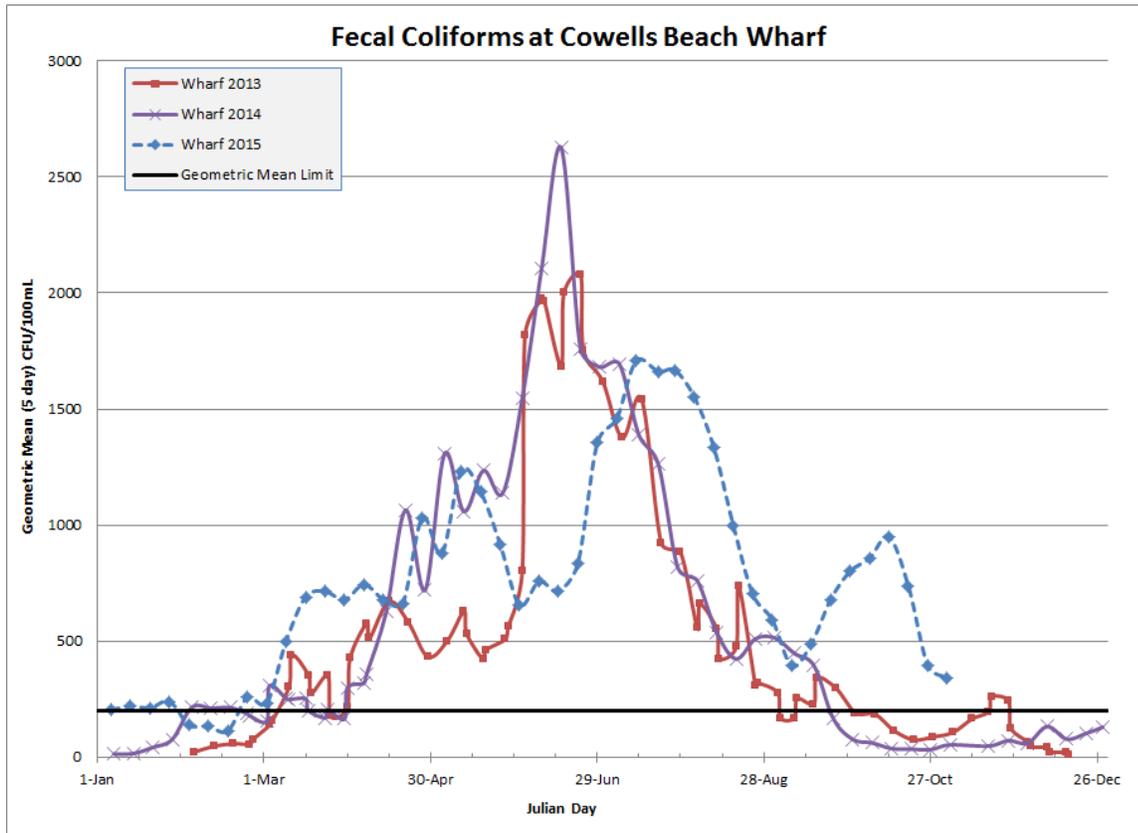
***Seasonality of the Issue:***

Whereas it is common that urban runoff causes elevated bacteria populations in adjacent beach waters especially in wet weather months, the profile of seasonal bacteria distribution at Cowell is the opposite of this common observation. Per the Heal the Bay Report, Cowell receives a passing grade during the winter months and a failing grade over the summer. All data compiled thus far, separately by the City and by the County, indicate this to be true. This fact has helped to establish that urban runoff is highly unlikely to be at the root of the bacteria problem at Cowell, and has also helped to focus resources on other more probable sources of the problem.<sup>5</sup>

---

<sup>5</sup> Additionally, because the data indicate that peak levels of indicator bacteria are associated with high levels of human beach use, the City has sought a license from the Environmental Protection Agency (EPA) to use the highly specific molecular markers of human-associated bacteria to study the issue

The graph below indicates the seasonal distribution of fecal coliform bacteria at Cowell Beach from 2013 through 2015.



### ***Geographic distribution of the Issue***

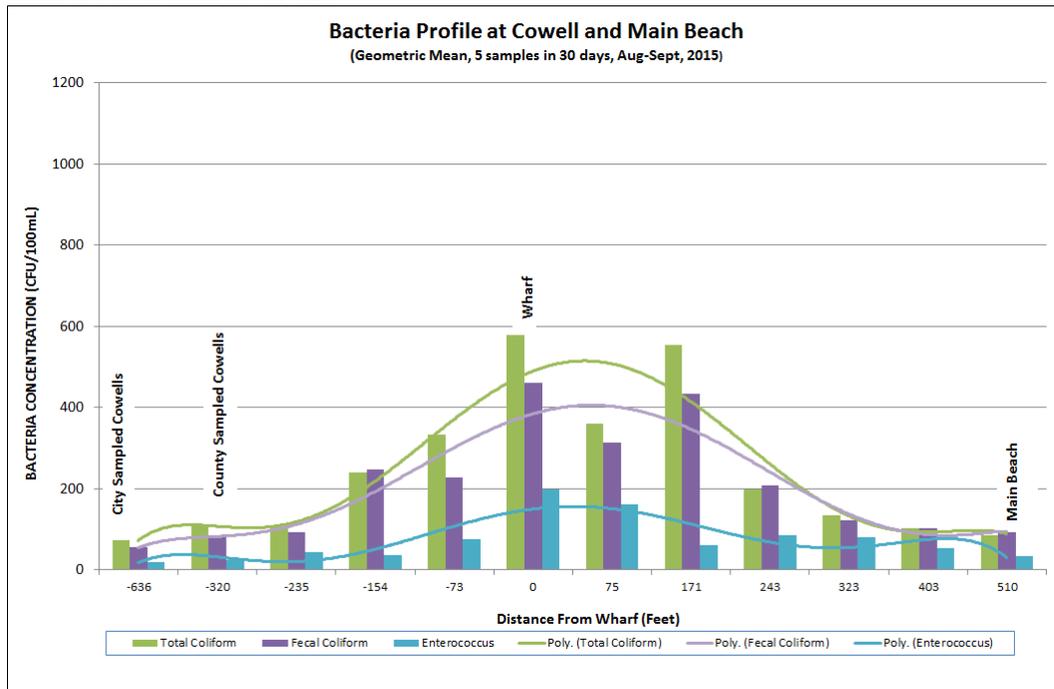
The Stanford study cited in this report ruled out the wharf as the source of the human-derived bacteria at Cowell, however that conclusion was only valid in specific reference to the sewer lines at the wharf. The same study indicated that birds and humans are a significant source of the bacteria at Cowell Beach in the area adjacent. The additional monitoring location in the surf, and the sharing of data between agencies began to paint a fuller picture of the geographic distribution of the problem.

A bacteria gradient profile emerged from one such study this past summer during the peak of the elevated bacteria counts. That study, summarized in the two graphs below, reinforced the hypothesis that birds roosting under the wharf may be a major contributing factor of the bacteria at Cowell. It's important to note that this was a preliminary study conducted over a relatively short period of time, so any conclusions drawn from such data needs to be understood within that context.

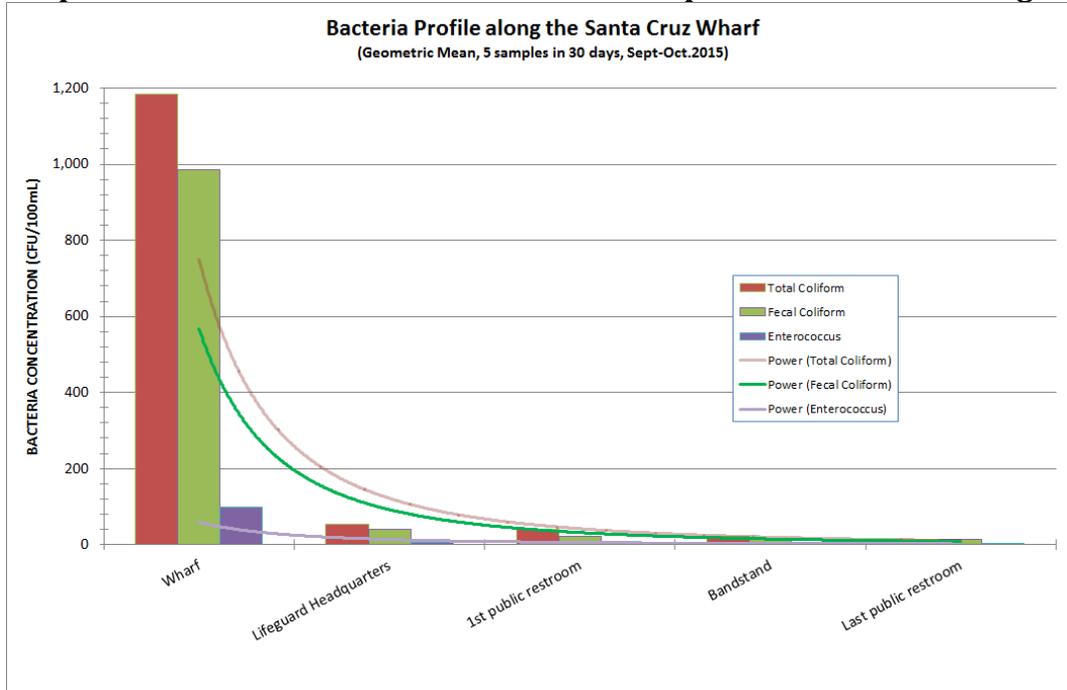
---

further, in order to rule out human impacts. The provisional license has been reviewed by the City Attorney's office and sent for final authorization by the EPA.

**Graph I: Distribution of indicator bacteria at marked distances along Cowell and Main Beach Santa Cruz.**



**Graph II: Distribution of indicator bacteria at specific landmarks along the wharf**



From this preliminary study three major findings emerged:

1. Cowell Beach bacteria are likely their highest under the wharf, and they tend to get significantly lower as one travels along the beach away from the wharf in either direction (East or West);
2. Cowell Beach bacteria along the wharf are significantly lower after only the first couple of hundred feet where the birds do not roost and nest; and
3. There were no sewage-associated bacteria detected in any of the 25 samples taken along the wharf, as indicated by caffeine measurements taken during the study to establish the distribution of bacteria along the wharf.

Therefore, the prudent steps seem to be controlling the bird populations, and continuing monitoring to verify there is no additional human-derivation bacteria occurring.

## **CWG Recommendations**

After many months of deliberating on the data, and discussing potential solutions, the group shifted its work to creating a set of prioritized recommendations to bring to City Council. The recommendations are organized below around the CWG established goals, and are listed in order of priority within each goal area as determined by a CWG voting process. The CWG added a project management goal area (as the City will likely turn this group over to an outside organization to manage).

City Council may choose to review this list further and implement some or all of the recommendations. As many of the recommendations include budgetary components, a budget spreadsheet has been prepared and attached.

### **1. Increase public understanding of Cowell's Beach Issue**

There has often been a lack of public knowledge surrounding both the issue at hand as well as the work that has been done to abate it. Therefore, it is critical that the public be consistently informed about the situation through a variety of media. If approved by City Council, CWG will take the following recommended actions:

- 1.1. Convene public meetings about the group's goals, with input from a technical oversight team
- 1.2. Create and maintain updates on Clean Cowell website to share basic information, data and updates
- 1.3. Continue press release updates
- 1.4. Maintain citizen science opportunities for monitoring the issue

### **2. Improve scientific understanding of Cowell Beach Issue**

Though much has been learned about the issue, there are still significant questions about the nature of the source. Additional studies based on this Group's recommendations and endorsement are necessary. If approved by City Council, CWG will take the following recommended actions:

- 2.1 Create Third-Party Science Advisory Committee
- 2.2 Conduct Microbial Source Tracking Study (MST) for multiple lines of evidence, including multiple source DNA testing
- 2.3. Conduct intensive groundwater testing around the hot spot
- 2.4. Conduct investigation of an epidemiological study to understand impact on human health

- 2.5. Conduct ocean current tracking study
- 2.6. Maintain citizen science opportunities in monitoring the issues

### **3. Reduce bacteria counts at Cowell Beach through policy and stewardship actions**

After the initial findings, the group has concluded that several concrete actions can be taken now that will likely affect the overall bacteria concentrations. Most of these efforts focus around the identified hotspot at the wharf. They will require ongoing investment from the City to put into action. If approved by City Council, CWG will take the following recommended actions:

#### 3.1 Reduce bacterial sources from human waste/sewage:

- Maintain sewer inspections and upgrades, produce lateral ordinance recommendations
- Conduct night time and early morning patrols on beach and under wharf with an increased police presence

#### 3.2 Reduce bacterial sources from bird feces:

- Put in screening, other modifications to reduce pigeon/gull roosting under the wharf near the beach, (regulatory permits may be required)

#### 3.3 Reduce bacterial sources from dog feces: more bags, patrols at Cowell, Main Beach, etc.

#### 3.4 Reduce potential bacterial sources from marine mammal feces:

- Recommendations to wharf alterations to reduce marine mammals hauling out on wharf.

### **4. Group Facilitation and Project Management**

It is recommended that Save The Waves Coalition spearhead the leadership and ongoing coordination of the Cowell's Working group moving forward. Solving Cowell Beach water quality issues is a long-term effort; therefore accountable, consistent and independent leadership is necessary for the success of this project once the Group sunsets from its original formation. This involves facilitating meetings, compiling resources, communicating between partners and managing technical advisors. The following recommendations are necessary tasks:

- 4.1. Facilitate monthly meetings, create agendas
- 4.2. City to manage contracts and contractors
- 4.3. Provide reports to City Council
- 4.4. Coordinate communications between partners

### **Next Steps**

City Council will review the CWG's findings and recommendations at its December 8, 2015 meeting, and provide general direction to staff. Depending upon the direction, City Council may consider potential budget adjustments to fund recommendations, potentially during the mid-year FY 2016 Budget review, or the FY 2017 Budget development process.

Save The Waves received a grant from the Community Foundation to partially fund the continuation of the Group's work. As the CWG is not a standing City Council committee, it is recommended that the CWG convene outside the City, to be hosted by the Save The Waves organization with city staff and partner organizations continuing to participate.

This group would be responsible for continuing the data and monitoring collaboration, while sharing information with the public and reviewing implementation of recommendations.

**FISCAL IMPACT:** Approval of this recommendation will not result in an immediate fiscal impact to the City. As noted above, however, many of the CWG recommendations have a budgetary component. Should City Council desire to pursue and approve those recommendations, City staff will prepare a FY 2016 budget adjustment to account for those costs, or bring them forward through the FY 2017 Budget process.

Submitted by:

Nik Strong-Cvetich  
Executive Director, Save the Waves  
Coalition (on behalf of the Cowell Beach  
Water Quality Group)

**ATTACHMENTS:**

City Council Agenda Report (September 2014: Creating the CWG)  
CWG Recommendations and Budget