CALIFORNIA COASTAL COMMISSION
South Coast Area Office
301 E. Ocean Blvd. Suite 300
Long Beach, CA 90802-4302
(562) 590-5071

W20b&21a

CDP 5-19-1296 & CC-0007-21 (CITY OF NEWPORT BEACH, RGP-54)

DECEMBER 15, 2021

EXHIBITS

Exhibit 1 – Vicinity Map and Plan Overview

Exhibit 2 – Permit Application Supplement: Proposed Regional General Permit 54 (Updated September 2021)

Exhibit 3 – Eelgrass Protection and Mitigation Plan (March 2015)

Exhibit 4 – Memo from Coastal Commission Senior Staff Ecologist Dr. Jonna Engel

Exhibit 5 – Proposed Beach Maintenance Locations

Exhibit 6 – EPA Sampling Results for LA-3 (2015)

L:\AutoCAD Project Files\090243-01 Newport CAD\Lower Newport Bay\RGP 54\0243RPG-RP-001.dwg VMap FIG-1

Jan 21, 2014 8:09am mpratschner

SOURCE: Image from Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Approximate Project Location:
33° 36.540', 117° 54.230'

ANCHOR QEA

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 1

Figure 1
Vicinity Map
RGP 54 Reauthorization

1 Introduction—Purpose and Nature of the Activity

For approximately 40 years, the City of Newport Beach (City) has maintained a Regional General Permit (RGP) 54 that provides a relatively streamlined process for permitting small dredging and dock maintenance projects between the bulkhead and pierhead lines in Newport Harbor. The current RGP 54 covers minor maintenance dredging and discharge of material previously deemed suitable for unconfined placement at adjacent beach sites, offshore disposal sites, or upland disposal sites approved for dredged material. The current annual limit for RGP 54 is 75,000 cubic yards (cy), and the individual project limit is 8,000 cy.

The existing RGP 54 includes several limitations that have decreased the utility of the permit. Many individuals and businesses are therefore unable to use the RGP, which often results in costly and lengthy separate permitting processes and sediment testing to achieve necessary improvements for navigational safety. In addition, regulatory and resource agencies must process individual permits for many small projects with minimal impacts such as beach maintenance, or projects dredging less than 1,000 cy with impacts to eelgrass, which is inefficient and drains agency resources. As a result, the City is seeking a new RGP 54 that will increase the value to the City, the community, and the agencies. The current and proposed RGP 54 coverage area is Newport Harbor and within submerged tidelands granted to the City and County of Orange (Figure 1).

The City is proposing the following improvements:

- Including a contingency approach and additional confirmatory sampling for addressing areas that have higher concentrations at the Z-layer (Section 3.2.2)
- Streamlining application review and processing:
  - Managing bay beach maintenance projects (i.e., relocating sloughed sand from low to high tide) to prevent sediment accumulating below docks (Section 4.2)
  - Allowing increased responsibility for the City to authorize small projects with minimal or no temporary impacts to eelgrass (Section 4.3)
- Adopting the *Eelgrass Protection and Mitigation Plan for Shallow Waters in Lower Newport Bay: An Ecosystem Based Management Program* (Eelgrass Plan) as a part of the RGP 54 program; note that the City is not proposing any changes to the Eelgrass Plan and will maintain compliance with all conditions.

LEGEND:

- Suitable to -10 feet MLLW plus 2 feet of overdepth for unrestricted disposal at the LA-3 ODMDS. Grain size required prior to beach replenishment or nearshore placement to demonstrate suitability.
- Suitable to -7 feet MLLW plus 1 foot of overdepth for unrestricted disposal at the LA-3 ODMDS. Z-layer testing to confirm post-dredge surface contains mercury less than 1 ppm prior to dredging to demonstrate newly exposed surface is clean. Grain size required prior to beach replenishment or nearshore placement to demonstrate suitability.
- Area not included under RGP 54.
- Material proposed for disposal at LA-3 ODMDS must have chemical testing for mercury with agency concurrence to verify suitability prior to disposal. Z-Layer testing is required to confirm post-dredge surface contains mercury less than 1 ppm prior to dredging to demonstrate newly exposed surface is clean. Material proposed for beach replenishment or nearshore placement must also have grain size verification prior to placement.
- Material proposed for disposal at LA-3 ODMDS must have chemical testing for mercury and PCBs with agency concurrence to verify suitability prior to disposal. Z-layer testing is required to confirm post-dredge surface contains mercury less than 1 ppm and PCBs less than 100 ppb prior to dredging to demonstrate newly exposed surface is clean. Material proposed for beach replenishment or nearshore placement must also have grain size verification prior to placement.
- Suitable to -10 feet MLLW plus 2 feet of overdepth for unrestricted disposal at the LA-3 ODMDS. Material proposed for beach replenishment or nearshore placement must have grain size verification and chemical testing for DDTs with agency concurrence to verify suitability prior to placement. Z-layer testing is required to confirm post-dredge surface contains DDT concentrations less than 18.0 ppb*.

SOURCE: Aerial from Bing maps. Coastline extents from City of Newport Beach.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE:
Areas included in RGP 54 are generally between the bulkhead and pierhead lines with the shoreline/boundary demarcated by the various colors/hatched lines. The colored lines, whether solid or dashed, always follow the shoreline rather than following individual fingers or docks. ODMDS (Ocean Dredged Material Disposal Site) and ppm (parts per million).

* Represents the 95% Upper Confidence Limit for surface sediment concentrations within the RGP permit area.

0 2000
Feet

Publish Date: 2018/08/01 11:54 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\RGP 54\0243 RPG-RP-012 SUITABLE.dwg FIG 16

ANCHOR QEA

Figure 2
Proposed RGP 54 Boundaries
RGP 54 Reauthorization

3 Detailed Description of the Activity

Major project elements of the proposed RGP 54 include the following:

- Maintenance dredging under and adjacent to private, public, and commercial docks, floats, and piers. Maintenance dredging would occur to a maximum depth of -10 feet mean lower low water (MLLW), plus 2 feet of overdepth allowance (1 foot paid and 1 foot unpaid), with an annual maximum dredge volume of 75,000 cy within the coverage areas and not to exceed 8,000 cy per individual project
- Discharge of dredged material at adjacent beach sites (for beach nourishment), the LA-3 Ocean Dredged Material Disposal Site (ODMDS), or an approved upland disposal site outside the coastal zone
- In conformance with the Eelgrass Plan, the maximum amount of allowable temporary impacts to eelgrass within the RGP 54 Plan Area is limited to a fixed percentage of each zone per year. The City is not proposing any changes to the approved October 2015 Plan, including all conditions and commitments stipulated in the Eelgrass Plan.

The RGP 54 Plan Area within the harbor is defined as bulkhead to pierhead line plus 20 feet bayward, including only those exceptions for structures that extend beyond this boundary in conformance with harbor development regulations defined by Chapter 17.35 of the Newport Beach Municipal Code.

This reauthorization is not proposing any changes to the RGP 54 Plan Area.

3.1 Sediment Sampling

The City has completed the Dredge Material Management Team (DMMT) review process to conduct maintenance dredging under the City's RGP 54. A Sampling and Analysis Plan (SAP; Anchor QEA 2017) was presented to the DMMT on June 23, 2017. The DMMT approved the sampling approach and proposed testing locations presented in the SAP. Sediment sampling was conducted pursuant to the approved SAP in September 2018, with sampling results summarized in the Sampling and Analysis Report (Anchor QEA 2018). Sediment sampling and analysis results and proposed placement activities were presented to the DMMT on June 27, 2018 (USACE 2018). Subsequent to that meeting, additional information and clarification was provided to the DMMT. Based on results of chemical and biological analyses and in coordination with the DMMT, RGP 54 sediments are recommended as suitable for beach replenishment or placement at the LA-3 ODMDS, except for Balboa Yacht Basin and Promontory Bay due to elevated metals concentrations. Additional depth limitations and testing requirements for the 2014 permit renewal are presented in Figure 2 and further described in Section 3.2.2.

Note that these depths and areas would not be changed with the proposed additional confirmatory sampling discussed in Section 3.2.2.

3.2 Dredging and Disposal

Proposed individual and total annual dredging volumes are conservative estimates based on the needs of anticipated users of RGP 54 and based on the City's experience managing Newport Bay resources and current trends in use of the bay. The maximum dredge depth is proposed to -10 feet MLLW, plus 2 feet of overdepth allowance (1 foot paid and 1 foot unpaid), which is consistent with the controlling depth of the Federal Channel and the needs of vessels such as sailboats with deep keels. The proposed annual maximum dredge volume is 75,000 cy within the coverage area and not to exceed 8,000 cy per individual project. This per-project and cumulative volume limit could accommodate several projects of varying size in a given year, potentially including:

- Five small marinas each dredging 8,000 cy
- Seven medium/large residences each dredging 3,500 cy
- Ten small residences each dredging 1,000 cy

This mix of dredging projects is reflective of the typical needs of the City, which supports thousands of slips and many marinas and water-dependent businesses, and is consistent with maintenance dredging needs observed under the current RGP 54. Water-based recreation and tourism are extremely important for the City, and maintenance of navigation within the harbor is critical for a variety of stakeholders, including residents, businesses, and visitors.

The type of dredging equipment would be determined by the contractor(s) on a per-project basis; this flexibility is necessary given the variety of potential project locations, placement sites, and volumes. Dredging would be conducted on performance-based requirements (e.g., dredge footprint and depths) that the contractor is required to follow, which would be confirmed through pre- and post-dredge surveys. Regardless of the method of dredging employed on a project, the contractor would be required to comply with the terms and conditions of RGP 54, just as with the current RGP. This approach is consistent with past practices under the current RGP 54 and with other dredging projects in the region.

3.2.1 Disposal Methods

Under the existing RGP 54, there are three disposal areas currently approved by all agencies: open-ocean disposal, beach nourishment, and upland disposal. The USACE also approves the use of confined aquatic disposal (CAD) facilities, but this method is currently only authorized by the USACE. The three disposal areas are described in Sections 3.2.1.1 to 3.2.1.3.

3.2.1.1 Beach Nourishment

Beach nourishment is currently the preferred area of disposal, used only if the content of the dredged material is suitable for disposal at this location. To be suitable, the content of the dredged material must be at least 75% sand.

3.2.1.2 Open-Ocean Disposal (LA-3)

Within the RGP 54 boundary, material deemed unsuitable for beach replenishment is suitable for disposal at the LA-3 ODMDS. If confirmatory sampling is required, the results must be below the thresholds stipulated in Figure 2 and as detailed in Section 3.2.2.

3.2.1.3 Upland

Finally, a last alternative location for disposal of dredged material is an approved upland landfill if the material is unsuitable for beach nourishment or open-ocean disposal. A specific disposal facility has not been identified because no specific project is being proposed. Individual applicants would be required to obtain approval for disposal of sediment or debris at an approved upland facility outside the coastal zone, including completion of any facility-required testing program, if applicable.

3.2.2 Additional Confirmatory Sampling

Based on sampling completed in 2017 and through negotiations with the DMMT, certain areas of the harbor require additional confirmatory sampling for both the dredge cut and predicted resulting Z-layer before material can be determined suitable for open-ocean disposal, or beach nourishment. The Z-layer is the remaining surface after the desired dredged depth is achieved.

The classification of different areas of Newport Bay, pertaining to dredging depths and other requirements based on sediment characterization efforts, is presented in Figure 2. Areas in yellow are not authorized under RGP 54 due to elevated chemical concentrations determined not suitable for open-ocean disposal. For all other areas, grain size analysis is required prior to discharge of sediment to verify compatibility with beach or open-ocean disposal. The areas delineated in dark blue do not require additional confirmatory sampling and are suitable to -10 feet MLLW plus 2 feet overdepth allowance for unrestricted disposal at the LA-3 ODMDS or beach nourishment. The areas delineated in green, light blue, red, and orange require additional confirmatory testing to verify contaminants do not exceed certain thresholds; these requirements are as follows:

- Green area: Suitable to -7 feet MLLW plus 1 foot of overdepth allowance for open-ocean disposal or beach nourishment. Z-layer testing is required to confirm that the post-dredge surface contains mercury levels less than 1 part per million (ppm) prior to dredging to demonstrate that the newly exposed surface will be clean.
- Light blue area: Suitable to -10 feet MLLW plus 2 feet of overdepth allowance for open-ocean disposal or beach nourishment. Confirmatory chemical testing is required for mercury to verify suitability prior to disposal. Z-layer testing is also required to confirm that the post-dredge surface contains mercury levels less than 1 ppm prior to dredging to demonstrate that the newly exposed surface will be clean.
- Red area: Suitable to -10 feet MLLW plus 2 feet of overdepth allowance for open-ocean disposal or beach nourishment. Confirmatory chemical testing is required for mercury and

polychlorinated biphenyls (PCBs) with agency concurrence to verify suitability prior to disposal. Z-layer testing is also required to confirm that the post-dredge surface contains mercury levels less than 1 ppm and PCB levels less than 100 parts per billion (ppb) prior to dredging to demonstrate that the newly exposed surface will be clean.

- Orange area: Suitable to -10 feet MLLW plus 2 feet of overdepth allowance with unrestricted open-ocean disposal. Material proposed for beach nourishment requires confirmatory chemical testing for DDTs to verify suitability prior to placement. Z-layer testing is also required to confirm that the post-dredge surface contains DDT concentrations less than 18.0 ppb prior to dredging to demonstrate that the newly exposed surface will be clean.

If an individual project is within an area requiring additional confirmatory sampling, applicants would collect samples and include the results as an attachment to the application.

3.2.2.1 Dredged Material Thresholds for Open-Ocean Disposal or Beach Nourishment

If the confirmatory sampling results are within the allowable thresholds, then the dredged material is authorized for open-ocean disposal or beach nourishment (pending results of the grain size analysis).

If the confirmatory sampling results indicate that the thresholds are not achieved, applicants can dispose of dredged material at an approved upland disposal landfill outside the coastal zone. Any upland disposal landfill would be permitted separately, and dredged material for disposal or placement at the sites would be subject to permit conditions associated with those sites.

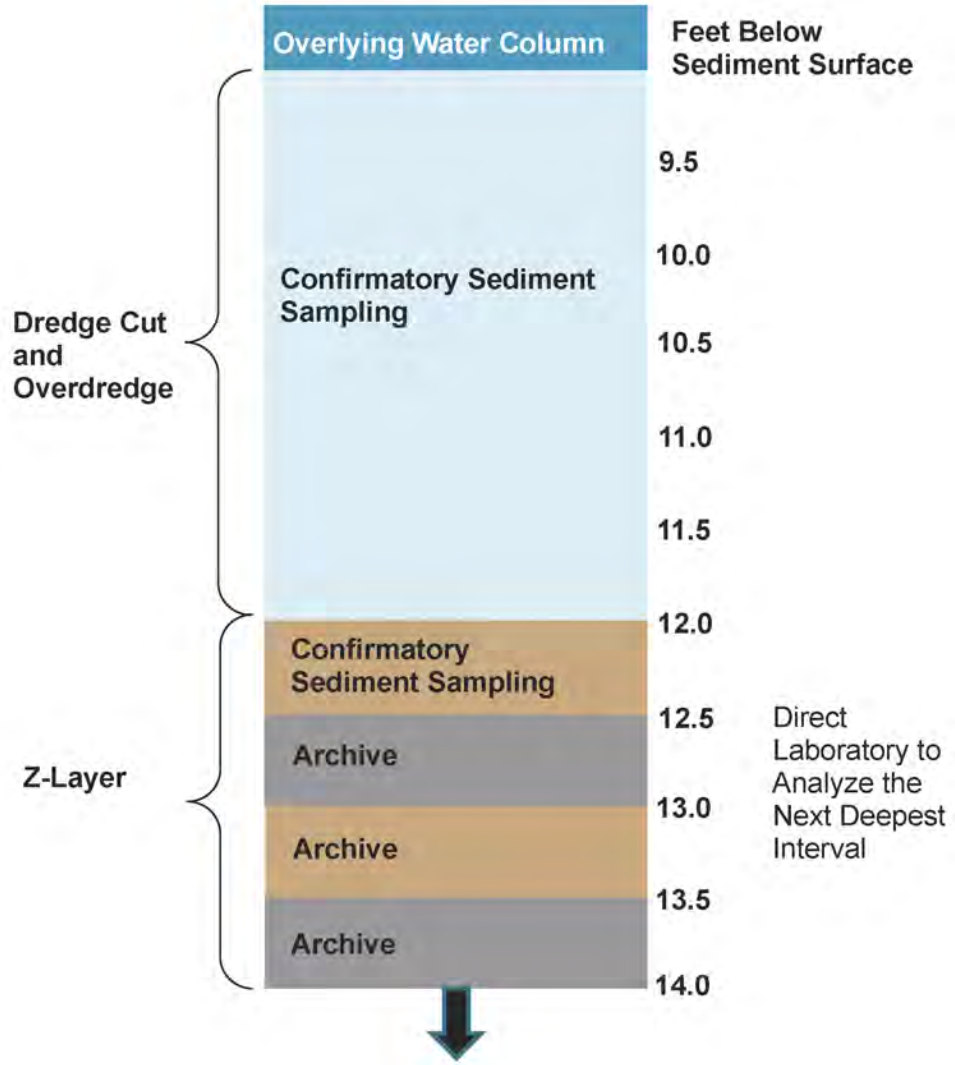
3.2.2.2 Z-Layer Thresholds for Dredging

As noted above, confirmatory sampling of the Z-layer is required for all areas delineated in green, light blue, red, and orange. While there is contingency in place for dredged material not meeting thresholds (option to dispose material upland), there is currently no contingency in place for projects exceeding Z-layer thresholds. If the results of the Z-layer testing exceed the allowable thresholds, the City is proposing the following option to dredge to a clean Z-layer, and would be limited to the hashed orange line presented as shown on Figure 2 - Proposed RGP 54 Boundaries Map.

Option to Dredge to Clean Z-Layer

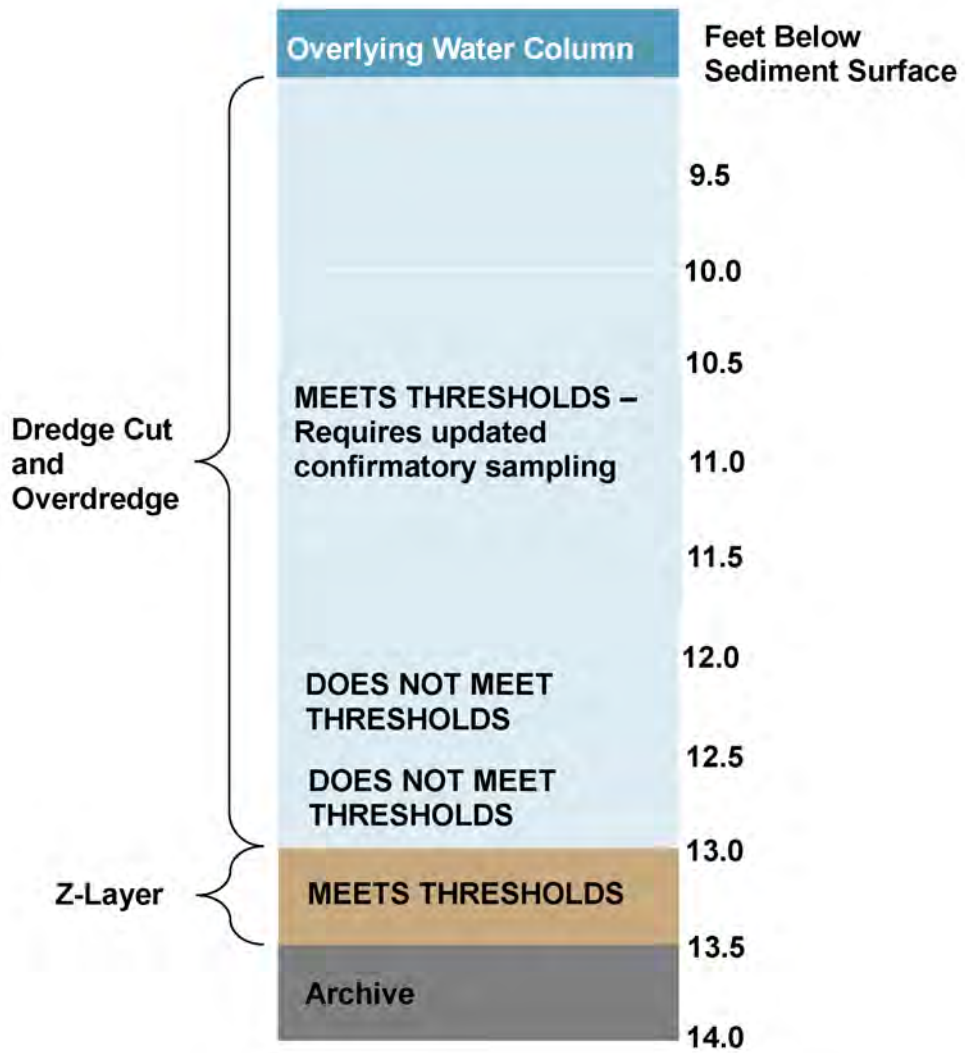
This option includes dredging deeper to remove contaminated material and achieve a clean Z-layer. During pre-dredge confirmatory sampling, individual applicants would collect sediment cores deeper than the targeted design depth plus allowed overdredge. The applicant would then direct the laboratory to analyze the desired Z-layer depth for the parameter(s) indicated by color, as presented in Figure 2 and described in Section 3.2.2 for the areas delineated in orange. The deeper intervals would be archived by the laboratory (Core Schematic A).

Core Schematic A



If the results of the desired Z-layer analysis do not meet the required thresholds, the applicant would then direct the laboratory to analyze the next deepest interval as shown in Core Schematic B, continuing with this approach until material meets the required thresholds in order to identify the depth of a clean Z-layer. This would be completed in 6-inch intervals (or as determined appropriate by the applicant). As the interval gets deeper, the expectation is that results would attenuate until the target threshold is achieved.

Core Schematic B



Once the clean Z-layer depth is determined, the individual applicant would need to re-evaluate the dredge design (now deeper) for removing additional material in order to leave a clean surface layer and confirm the disposal option.

Depending on the depth where a clean Z-layer is encountered, dredging may be required beyond the authorized design and allowable overdredge depths stated in the RGP and would require the following agency coordination and analysis:

a) Individual applicants would be required to collect and composite a full core length for any material proposed for dredging below -12 feet MLLW. The composite sample would be

analyzed for full confirmatory chemistry and compared against the composite samples from the areas designated with a hashed orange line presented as shown on Figure 2 - Proposed RGP 54 Boundaries Map. If the composite sample chemistry is within the range found to be suitable for ocean disposal based on the full Tier III testing program, then USEPA approval would be required for consideration under a Tier I exclusion.

b) In addition to the 2018 data for this particular composite, a comparison can be made with the Z-layer chemistry to all the composite area results from 2018 as well as past RGP results and USACE results

c) If multiple owners are testing at the same time, the cores can be composited for the ocean disposal assessment. If owners would like to pursue this option, the owners and the City should coordinate with USEPA Region 9 in advance so discussion regarding the compositing and ensuring they understand the risks of that approach (i.e. if the composite fails, then all of the areas within the composite would fail unless the individual cores were tested).

The benefit to this approach is that material exceeding thresholds would be removed from the harbor and a clean surface would remain; however, there are limitations to this approach, including the following:

- Dredging depths are limited in some areas by existing features, such as piles and seawalls, so dredging to a deeper clean Z-layer is not always possible.
- Continuing to sample at intervals to reach a clean Z-layer may not be feasible.
- Reaching a clean Z-layer and re-evaluating the dredge design may result in a larger dredge volume than the individual applicant needed. For example, if a clean Z-layer is encountered at -15 feet, but the homeowner only requires -7 feet, the additional volume—and associated costs of dredging and disposal—may not be practical.
- A safe offset from the existing seawall is typically integrated into the dredge design (typically ranging from 5 to 10 feet). When incorporating the side slopes from the offset to the bottom of the dredge footprint, the depth that can be achieved within the RGP 54 boundary is limited. Additionally, in areas where depths become shallower waterward of the RGP 54 boundary (e.g., Linda Isle or de Anza Peninsula), side slopes on the waterward side of the dredge area are incorporated. This prevents material from outside the dredge footprint falling back into the dredge area. With deeper dredging depths required to reach a clean Z-layer, offsets and side slopes may severely limit the areas that can be dredged.

4 Application Review and Processing

The City's Department of Public Works is the primary point of contact for applicants seeking authorization under RGP 54. Applications were designed to confirm that each project is consistent with the terms and conditions of the existing RGP 54 and that the application is complete and includes the required information stipulated by each agency. Applications are then submitted monthly in batches to each agency for consideration.

The RGP 54 Implementation and Management Program Memorandum describes how the City manages the program, processes, existing permits and approvals, reporting, and other pertinent information that will continue with implementation of this reauthorization. Much of the information is also available on the City's website (City of Newport Beach 2019).

4.1 Additional Authority Delegated to City

As demonstrated with the current management of RGP 54, delegating responsibility to the City prevents duplication and increases the efficiency to implement the program. The City has demonstrated over the past 3 years under the current RGP 54—and historically since the inception of the general permit going back to the 1970s—its ability to manage the numerous requirements and conditions. Under the proposed RGP 54, additional authority delegation is requested for bay beach maintenance activities, as well as for small projects with minimal or no temporary eelgrass impacts. Larger projects are less frequent and warrant a coordinated City/agency review proportionate with the scope of the projects.

4.2 Bay Beach Maintenance Projects

The City is proposing authority to approve routine bay beach maintenance projects. This includes the relocation of sloughed sand from the low tide line (-1 foot MLLW) to the high tide line and is limited to beaches on Balboa Island, Beacon Bay, publicly owned street-end beaches, and other locations. Addressing these locations on an as-needed basis—often as funding becomes available—would address future navigational constraints by relocating sediment before it accumulates below docks. It would also further limit temporary eelgrass impacts by preventing a need for dredging at depths where eelgrass grows (below the low tide line). Bay beach maintenance would involve shallow-depth hydraulic dredging during high tide or traditional tractor work during low tide. Additional components of the proposed bay beach maintenance projects include:

- No impacts to eelgrass would be allowed during any bay beach maintenance projects.
- Pre- and post-bathymetry and topographic surveys for bay beach maintenance projects would be eliminated, as most of the work would occur partially within the water and higher up on the beach. Additionally, the volume difference between pre-and post-construction surveys would be difficult to quantify given the overlapping areas where material would be

moved. For the purposes of estimating volumes, the City will assume approximately 1 foot of excavation per square foot of beach.

Bay beach maintenance would occur along 25,000 linear feet of shoreline in Newport Harbor. The beach width would be approximately 10 feet wide, requiring excavation of approximately 1 foot throughout the proposed area. Based on 25,000 linear feet of bay beach maintenance, the City is proposing a not-to-exceed annual volume of 9,500 cubic yards over 6 acres. The City is proposing that the bay beach maintenance projects would not count toward the 75,000-cy annual maximum dredge volume limit for RGP 54.

Applicants would still be required to submit documentation to the City (or in the case of City projects, submit documentation to the file) to confirm that the areas are within the bay beach maintenance areas and that no temporary impacts to eelgrass would occur, as well as to track areas and presumed volumes. The City would include documentation of these projects in the annual reports to the agencies.

4.3 Small Projects with Minimal Eelgrass Impacts

Under the existing RGP 54, the USACE delegates authority to the City to approve projects dredging up to 2,500 cy with no potential impact to existing eelgrass. The CCC and RWQCB still require review of all projects proposed under the existing RGP 54. The City is proposing to extend that delegation authority to all agencies, and the City is also proposing authority to approve projects dredging less than 2,500 cy with temporary impacts to eelgrass. This process would increase the efficiency of the review process because the City would be able to manage the numerous smaller projects that have negligible impacts much more quickly than the agencies, therefore decreasing the agency workload. The total allocated temporary disruption of eelgrass would not change under this proposed modification to the existing RGP 54.

L:\AutoCAD Project Files\090243-01 Newport CAD\Lower Newport Bay\RGP 54\0243RPG-RP-001.dwg VMap FIG-1

Jan 21, 2014 8:09am mpratschner

SOURCE: Image from Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

Approximate Project Location:
33° 36.540', 117° 54.230'

ANCHOR QEA

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 2 p. 12 of 13

Figure 1
Vicinity Map
RGP 54 Reauthorization

SOURCE: Aerial from Bing maps. Coastline extents from City of Newport Beach.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTE:
Areas included in RGP 54 are generally between the bulkhead and pierhead lines with the shoreline/boundary demarcated by the various colors/hatched lines. The colored lines, whether solid or dashed, always follow the shoreline rather than following individual fingers or docks. ODMDS (Ocean Dredged Material Disposal Site) and ppm (parts per million).

LEGEND:

- Suitable to -10 feet MLLW plus 2 feet of overdepth for unrestricted disposal at the LA-3 ODMDS. Grain size required prior to beach replenishment or nearshore placement to demonstrate suitability.
- Suitable to -7 feet MLLW plus 1 foot of overdepth for unrestricted disposal at the LA-3 ODMDS. Z-layer testing to confirm post-dredge surface contains mercury less than 1 ppm prior to dredging to demonstrate newly exposed surface is clean. Grain size required prior to beach replenishment or nearshore placement to demonstrate suitability.
- Area not included under RGP 54.
- Material proposed for disposal at LA-3 ODMDS must have chemical testing for mercury with agency concurrence to verify suitability prior to disposal. Z-Layer testing is required to confirm post-dredge surface contains mercury less than 1 ppm prior to dredging to demonstrate newly exposed surface is clean. Material proposed for beach replenishment or nearshore placement must also have grain size verification prior to placement.
- Material proposed for disposal at LA-3 ODMDS must have chemical testing for mercury and PCBs with agency concurrence to verify suitability prior to disposal. Z-layer testing is required to confirm post-dredge surface contains mercury less than 1 ppm and PCBs less than 100 ppb prior to dredging to demonstrate newly exposed surface is clean. Material proposed for beach replenishment or nearshore placement must also have grain size verification prior to placement.
- Suitable to -10 feet MLLW plus 2 feet of overdepth for unrestricted disposal at the LA-3 ODMDS. Material proposed for beach replenishment or nearshore placement must have grain size verification and chemical testing for DDTs with agency concurrence to verify suitability prior to placement. Z-layer testing is required to confirm post-dredge surface contains DDT concentrations less than 18.0 ppb*.

* Represents the 95% Upper Confidence Limit for surface sediment concentrations within the RGP permit area.

0 2000
Feet

Publish Date: 2018/08/01 11:54 AM | User: mpratschner
Filepath: K:\Projects\0243-City of Newport Beach\RGP 54\0243 RPG-RP-012 SUITABLE.dwg FIG 16

ANCHOR QEA

Figure 2
Proposed RGP 54 Boundaries
RGP 54 Reauthorization

EELGRASS PROTECTION AND MITIGATION PLAN FOR SHALLOW WATERS IN LOWER NEWPORT BAY:

AN ECOSYSTEM BASED MANAGEMENT PROGRAM

City Of Newport Beach
Public Works Department
Harbor Resources Division
PO Box 1768
Newport Beach, CA 92658-8915

OCTOBER 14, 2015

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 1 of 44

TABLE OF CONTENTS

Summary of the Eelgrass Protection and Mitigation Plan. i

Introduction. 1

Background. 2

Elements of the Plan. 5

1. City Assumes Lead Responsibility. 5
2. Tier Levels Based on Eelgrass Surveys. 10
3. Best Management Practices (BMPs). 14
4. Program to Promote Eelgrass Growth and Establishment. 16

Initial Program Actions. 17

Reporting and Adaptive Management. 18

Other Conditions Applicable to this Plan. 19

Acknowledgments. 21

References. 22

TABLES

Table 1. Eelgrass Tiers for Activities Occurring in the Project Area. v
Table 2. City Sponsored Shallow Water Eelgrass Surveys in Newport Harbor. 9

FIGURES

Figure 1. Location of sampling areas within the shallow water eelgrass zone of Lower Newport Bay. 8
Figure 2. Location of Stable, Transitional, and unvegetated eelgrass zones based on CRM (2010). 9
Figure 3. Tidal flushing in days for the lower and upper Newport Bay area. 12

Appendix A Project Area Maps
Appendix B Eelgrass Survey Data for the Project Area

SUMMARY OF THE EELGRASS PROTECTION AND MITIGATION PLAN

The purpose of this document is to describe the City of Newport Beach's eelgrass (*Zostera marina*) protection and mitigation plan (the Plan) to be used within Newport Harbor for routine maintenance dredging activities typically undertaken by individual property owners. The Plan focuses on the shallow water eelgrass protection and mitigation measures associated with the following action:

(1) Minor maintenance dredging under and adjacent to currently authorized private, public, and commercial docks, floats, and piers. Dredging depth is not to exceed -10 feet mean lower low water (MLLW; plus 2 feet of allowable over depth).

These types of impacts to eelgrass are temporary in nature. Temporary refers to the fact that the maintenance dredging is short lasting and that immediately following the dredging, the area is subject to sedimentation. The area to be dredged generally consists of the area beneath the boat and dock where eelgrass is generally not found and therefore in these areas there is little or no impact to eelgrass. Eelgrass, however, may be found on the side slopes of the dredged area and therefore comprise only a small or minor area compared to the overall dredging footprint. The area outside the dredging footprint is usually not disturbed by the dredging activity; although there may be some temporary impacts due to turbidity. Maintenance dredging impacts would be minor, as they would occur in small areas within the RGP 54 and Plan boundaries, which cover a relatively small portion of Newport Harbor and the Stable and Transitional Zones.

Eelgrass has been observed to re-establish itself in these areas following dredging events as natural rates of siltation occur. Based on Newport Harbor-specific data reported by Coastal Resources Management Inc. (2010), the shallow water population of eelgrass is found at depths up to -6 to -15 feet relative to MLLW, with greater depth penetration in the portions of the harbor closest to the ocean inlet and lower penetration within Upper Newport Bay. Eelgrass is spread by seed, and it can colonize areas within a few years along the edges of the dredged area. Because eelgrass impacted by dredging is usually at the edge of a dredged area (i.e., it does not grow under the existing docks or boats), the depth of dredging is usually shallower at the sides than within the boat slip, and this slope is within the zone that can be occupied by eelgrass. Other studies have shown that eelgrass can occur within 1 to 2 growing seasons following dredging; however natural variation between years can be substantial and must be considered when evaluating recovery times (Sabol et al, 2005).

The area within Newport Harbor where maintenance dredging would occur is referred to as the Plan Area and comprises portions of the harbor defined as:

> The bulkhead to pierhead line plus 20 feet bayward, including those exceptions for structures that extend beyond this boundary as of 2013 in conformance with harbor development regulations or policy.

Within the Harbor, there are three zones that have been defined in terms of eelgrass presence:

> Stable Zone: An area within the Plan Area that exhibits little variation in overall abundance from year to year. This Zone contains the greatest amount of eelgrass in large contiguous beds and is the area closest to the harbor entrance.
>
> Transitional Zone: An area within the Plan Area that exhibits higher variation in overall abundance between surveys and has sparser coverage by eelgrass in scattered eelgrass beds.
>
> Unvegetated Zone: An area within the Plan Area within which eelgrass has not been observed during the surveys. This Zone is in the western end of the Harbor.

Within the allowable 75,000 cubic yards/yr (and 8,000 cubic yards per event) of maintenance dredging in the Plan Area, the maximum amount of allowable impacts to eelgrass will be limited to a fixed percentage of each Zone per year. The percentage of eelgrass that is allowed to be impacted and the best management practices to be implemented are based on Tier levels that have been established for each Zone.

Three Tiers are used:

> Tier 1: A level at which eelgrass is generally abundant and thriving based on the upper 40% of observations[1] from the last four biannual surveys of eelgrass within the Plan Area.
>
> Tier 2: A level at which eelgrass is less abundant and may be under some environmental stress based on the middle 20% of observations from the last four biannual surveys of eelgrass within the Plan Area.
>
> Tier 3: A level at which eelgrass has declined to lower levels and may be experiencing significant environmental stress based on the lower 40% of observations from the last four biannual surveys of eelgrass within the Plan Area.

[1] The Tiers are based on a proportion of abundance observations taken between 2003 and 2014 assuming a normal distribution.

The Tier level applicable will be determined from the most recent Plan Area survey, e.g. the amount of eelgrass present will be compared to the ranges set for each of the Tiers. The impacts to eelgrass allowed in the Stable and Transitional Zones will then be set —up to 5% of the population[2]/year in Tier 1 and up to 3% of the population/year in Tier 2. However, in no case, shall the total impact to eelgrass in the Stable and Transitional Zones within any year be greater than 1% of the estimated total abundance of eelgrass within Newport Harbor as determined from the most recent full Harbor[3] eelgrass survey. The Tier levels and the actions that the City will undertake are defined in Table 1, and a flow chart demonstrating the process is shown on Figure 1. The Tier levels may be adjusted in the future based on subsequent survey results, but only with approval by the federal and state agencies with permit authority over the maintenance dredging activities.

Mitigation for temporary loss of eelgrass, for activities covered under this Plan would be implemented under an approach that includes four elements:

(1) **City Assumes Lead Responsibility –** The City will enforce compliance with the Plan, subject to agency oversight.[4] Consistent with its management role, the City, rather than individual property owners, will generally be responsible for surveying and data gathering. This will ensure decisions are made based on the City's reliable, professionally gathered data, while relieving individual property owners of a burden they generally lack the expertise to effectively implement.

(2) **Biannual Surveys of Eelgrass Abundance –** The Plan promotes an ecosystem-based approach; the key metric of eelgrass protection is the maintenance of a sustainable shallow water eelgrass population. The focus of the City's management will be to protect and promote shallow water eelgrass populations. Dredging is conditioned on compliance with best management practices (BMPs) for avoiding eelgrass disturbance where possible. If the abundance of eelgrass decreases in the Plan Area, annual allowable impacts to eelgrass under this Plan will also decrease and increased mitigation will be implemented in a phased manner. If additional impacts to eelgrass within the Plan Area are proposed after the annual limit is reached or

[2] The population acreage within each Zone used for this calculation is the average of the four baseline eelgrass surveys conducted between 2003 and 2014. This acreage is 16.78 acres for the Stable Zone and 3.81 acres for the Transitional Zone.

[3] The full Harbor survey includes the Plan Area and the subtidal areas outside of the Plan Area. The most recent full Harbor survey was conducted in 2013-2014 and was found to be 88.27 acres.

[4] The Plan will be implemented in coordination with Regional General Permit 54. Other projects that have temporary impacts to eelgrass that require Individual Permits under Section 404 of the Clean Water Act could qualify, if they occur within the Plan Area in Newport Bay and are within the thresholds established under this Plan.

eelgrass acreage within the Stable or Transitional Zone is at or below Tier 3, the applicant will need to apply mitigation consistent with the California Eelgrass Mitigation Policy (CEMP) with approval from federal and state agencies.

(3) **Best Management Practices –** The City will approve the application of the Plan for projects subject to property owner compliance with BMP standards. BMPs include avoidance and, when appropriate under the Tier levels, active eelgrass establishment techniques, such as seeding using buoy deployed seed bags (BDSB) and/or use of TERFS™.[5] Other transplanting methods may also be used if they are effective in establishing and promoting eelgrass establishment. BMPs will minimize negative impacts to existing eelgrass and encourage additional population growth.

(4) **Program to Promote Regrowth and Establishment –** The City will encourage and support pilot testing of BDSB and TERF™ strategies, begin an education program to encourage the public to view eelgrass as a valuable component of the ecosystem rather than a nuisance weed that restricts boat and dock use, and where appropriate, consider other methods to create areas suitable for eelgrass.

The Plan provides an incentive to the City and property owners to promote a healthy eelgrass population in Newport Bay, as the increased eelgrass occurrence will be accommodated by the flexibility of the Plan to allow for greater temporary impacts. The Plan will encourage innovative and effective methods to be used to promote eelgrass establishment throughout the bay, where conditions are suitable, as opposed to limited project-by-project mitigation.

Based on the most recent survey (Appendix B) and the Tier levels established under this Plan, the Tier level starting in August 2015 for the Stable Zone is Tier 1 (19.3 acres in Stable Zone Plan area exceeds 17.2 acres) and for the Transitional Zone is Tier 2 (3.45 acres in Transitional Zone Plan area is within the range of < 4.5 to ≥ 3.1 acres).

[5] TERF™ refers to "Transplanting Eelgrass Remotely with Frame Systems." Adult plants are transplanted using a frame system to which the plants are attached.

Table 1. Eelgrass Tiers for Activities Occurring in the Plan Area in Newport Harbor

Shallow Water Eelgrass in Plan Area		Allowable Annual Temporary Impacts to Eelgrass in the Plan Area[1]	City of Newport Beach Action
Stable Zone	Transitional Zone		
Tier 1			
Eelgrass extent in Plan Area ≥ 17.2 acres	Eelgrass extent in Plan Area ≥ 4.5 acres	Up to a total of 5% of the eelgrass in the Stable Zone Plan Area (= 0.84 acres[2]) subject to annual maximum limit below Up to a total of 5% of the eelgrass in the Transitional Zone Plan Area (=0.19 acres) subject to annual maximum limit below Annual maximum for Stable and Transitional Zone is no more than 1% of the total eelgrass in the most recent harbor wide survey. (Currently = 0.88 acres)	• The City will develop, test, and/or improve methods to collect and use eelgrass seeds for deployable seed bagging and to construct or use eelgrass TERFS™ devices. This work will be done by the City proportional to the amount of routine maintenance undertaken by the dock owners. • The City conducts surveys every 2 years to determine extent of eelgrass coverage in the Plan Area and every four years expanded to the full Harbor. • Conduct education program to help the public see eelgrass as a valuable ecosystem component rather than a nuisance weed that restricts boat and dock use • Encourage owners to minimize the size of docks and floating structures or use docks and floating structures that maximize light penetration • Continue to update BMP procedures to minimize impacts to eelgrass and to promote eelgrass coverage.
Tier 2			
Eelgrass extent in Plan Area < 17.2 to ≥ 16.3 acres	Eelgrass extent in Plan Area < 4.5 to ≥ 3.1 acres	Up to a total of 3% of the eelgrass in the Stable Zone Plan Area (= 0.5 acres) subject to annual maximum limit below. Up to a total of 3% of the eelgrass in the Transitional	• The City will require applicants to implement deployable seed bagging, TERFS™ , and/or other transplant method BMP at impact area. • The City conducts surveys every 2 years to determine extent of eelgrass coverage in Plan Area and every four years expanded to the full Harbor. • Conduct education program to help the public see eelgrass as a

Shallow Water Eelgrass in Plan Area		Allowable Annual Temporary Impacts to Eelgrass in the Plan Area[1]	City of Newport Beach Action
Stable Zone	Transitional Zone		
		Zone Plan Area (= 0.11 acres) subject to annual maximum limit below. Annual maximum for Stable and Transitional Zone is no more than 1% of the total eelgrass in the most recent harbor wide survey. (Currently = 0.88 acres)	valuable ecosystem component rather than a nuisance weed that restricts boat and dock use • Encourage owners to minimize the size of docks and floating structures or use docks and floating structures that maximize light penetration • Continue to update BMP procedures to minimize impacts to eelgrass and to promote eelgrass coverage
Tier 3			
Eelgrass extent in Plan Area is < 16.3 acres	Eelgrass Extent in Plan Area is < 3.1 acres	Eelgrass impacts only allowed with standard CEMP mitigation	• Any impacts to eelgrass will be mitigated using the methods (e.g. transplanting), mitigation ratios, and performance standards in the National Marine Fisheries Service California Eelgrass Mitigation Policy. • If shallow water population remains below lowest Tier 3 level for two consecutive survey periods, the City will work with the agencies to determine the cause of the decline and, if necessary, initiate additional actions to improve or create habitat suitable for re-establishment of eelgrass populations. • The City conducts surveys every 2 years to determine extent of eelgrass coverage in the Plan Area and every four years expanded to the full Harbor.

Notes:

1 If additional impacts to eelgrass are proposed within the Plan Area after the Tier limit is reached during any annual reporting period, mitigation would be provided by the project proponent independent of this Plan and consistent with the CEMP or other applicable mitigation policy.

2 The allowable maximum acreage within each Zone has been determined from a percentage of the mean of the last four surveys conducted between 2003 and 2014.

Newport Bay Eelgrass Protection and Mitigation Plan

Eelgrass Survey using Standardized Methods

Plan Area Survey every other year

Harbor Wide Survey every four years

Determine Tier Level using most recent survey data relative to fixed Tiers

Tier 1
- Stable: greater than or equal to 17.2 ac
- Transitional: greater than or equal to 4.5 ac

Tier 2
- Stable: 16.3 to 17.2 ac
- Transitional: 3.1 to 4.5 ac

Tier 3
- Stable: less than 16.3 ac
- Transitional: less than 3.1 ac

If Tier 3 for two survey periods; City and agencies confer on additional actions

Annual Implementation Process

Applicant submits Project to City under RGP or Individual Permit application to Corps

City determines Tier Level that sets allowable eelgrass impacts for year

City verifies Project meets RGP conditions or, if Individual Permit, that project is consistent with the Plan

City determines impacts to eelgrass for each project based on most recent survey data and within allowable Tier

Within allowable annual impact

Exceed Annual allowed impact

Applicant to mitigate under CEMP

City authorizes activity with BMPs appropriate to Tier level

City assures compliance with authorization and maintains database on completed actions

City implements general elements of Plan to protect and maintain EMT

City provides annual report on activities to Agencies

INTRODUCTION

The purpose of this document is to describe an Eelgrass Protection and Management Plan (the Plan) for temporary and minor impacts to eelgrass (*Zostera marina*), associated with maintenance dredging at boat docks typically undertaken by individual property owners and small commercial operators, and include:

> Minor maintenance dredging to be performed under and adjacent to currently authorized private, public, and commercial docks, floats, and piers. Dredging depth is not to exceed -10 feet mean lower low water (MLLW), plus 2 feet of allowable over depth.

The Plan is an outcome of the City of Newport Beach Harbor Area Management Plan (HAMP), as issued in April 2010 and approved by City Council in November 2010. The HAMP established goals and best management practices (BMPs) to ensure a healthy eelgrass population within Newport Harbor, including the development of the Plan.

Consistent with its role as Newport Bay's primary steward and the California Eelgrass Mitigation Policy's (CEMP), the City developed this Plan tailored specifically to Newport Bay's shallow waters adjoining residences. The Plan will govern practices related to a portion of Lower Newport Bay's existing eelgrass population—the shallow water eelgrass zone generally found at depths less than 10 feet below MLLW. Much of the shallow water eelgrass population is located in areas occupied by private piers, docks, and small commercial facilities. The Plan focuses on those impacts that are minimal and temporarily associated with maintenance dredging in these shallow waters.

Eelgrass is very resilient in these areas and recolonizes areas between dredging events as the areas silt in over time. There appears to be an abundant source of seeds to allow for eelgrass establishment in areas affected by the dredging activity. Based on Newport Harbor-specific data reported by Coastal Resources Management Inc. (2010), the shallow water population of eelgrass is found at depths up to -6 to -15 feet relative to MLLW, with greater depth penetration in the portions of the harbor closest to the ocean inlet and lower penetration within Upper Newport Bay. Because eelgrass impacted by dredging is usually at the edge of a dredged area (i.e., it does not grow under existing docks or boats), the depth of dredging is usually shallower at the sides than within the boat slip, and this slope is within the zone that can be occupied by eelgrass. Additionally, because maintenance dredging is not occurring in all areas at the same time, various stages of eelgrass recovery occur throughout the harbor.

The Plan will serve the principal goals of protecting and promoting a long-term sustainable eelgrass population while serving Lower Newport Bay's navigational and recreational

beneficial uses. The touchstone of the Plan is an ecosystem-based approach that works by protecting a sustainable eelgrass population in the Lower Newport Bay and enforcing BMPs that will promote eelgrass growth.

The approach to managing the Harbor's resources embodied in this Plan is consistent with the California Ocean Protection Council's (COPC) Five Year Strategic Plan to implement ecosystem-based management (EBM) (COPC 2006). According to COPC, the goal of EBM is, "to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that focus on a single species, sector, activity, or concern."

Ecosystem-based management (EMB) recognizes there are multiple objectives and benefits provided by marine systems, rather than single ecosystem or species services. Such benefits include vibrant commercial and recreational fisheries, biodiversity conservation, renewable energy, and coastal protection. In addition, EMB is adaptable to changing conditions and taking into consideration that healthy systems exhibit resilience to disturbances; therefore, management measures should consider and adapt to large and small scale factors that affect ecosystem change. The EMB approach is also consistent with the *Final Recommendations of the Interagency Ocean Policy Task Force* (CEQ 2010), which emphasizes the concept of Coastal and Marine Spatial Planning for management of coastal resources. The National Marine Fisheries Service (NMFS) has taken a lead role in promoting and implementing EMB within its fisheries, coral reef, and marine sanctuaries management programs. The extension of this approach to eelgrass management in Newport Harbor is proposed in this Plan.

BACKGROUND

The City, as the primary steward of Newport Bay, has invested significant resources to ensure a healthy eelgrass population thrives in the Bay. For instance, the City has retained experts to develop this Plan, conducted eelgrass mitigation banking projects, engaged contractors to conduct bay-wide monitoring and surveying of eelgrass distribution using consistent and repeatable methods, and, most importantly, worked to make the bay more hospitable to eelgrass through the implementation of water quality protection measures. Most recently, the City approved a HAMP that sets an overall goal to, "support a sustainable estuary ecosystem able to be integrated with upstream sustainable watersheds and adjacent coastal area systems."

As a result of these extensive efforts, City staff, as well as the scientists and consultants who have been retained to assist the City, have developed considerable data, knowledge, and expertise about eelgrass ecology in Newport Bay.

The City, as part of its commitment to the 2010 HAMP, developed this Plan for the shallow water eelgrass population in the Lower Bay that promotes a healthy eelgrass habitat and maintains the Bay's navigational, commercial, and recreational uses. The Plan specifically addresses the temporary and minimal impacts to eelgrass resulting from maintenance dredging projects associated with those facilities with the Plan Area. The Plan Area is defined as follows:

> The bulkhead to pierhead line plus 20 feet bayward and including those exceptions for structures that extend beyond this boundary as of 2013 in conformance with harbor development regulations or policy.

The specific boundary of the Plan Area has been established based on harbor surveys of existing docks and is attached as Appendix A of this document.

The Stable and Transitional Zones are those areas within the Harbor where eelgrass has been known to occur based on long-term surveys and is scientifically based on known oceanographic factors (e.g., circulation, turbidity, salinity, and temperature) that affect eelgrass establishment and growth. Further discussion of these zones and a map showing their occurrence are found on Figure 2.

The Plan consists of four main parts:

(1) The first part establishes the City as the primary steward of eelgrass habitat in the Bay by placing the responsibility for approving use of the Plan for small maintenance dredging projects, as well as monitoring, surveying, and data gathering on the City rather than on individual property owners. The City would take lead responsibility for initial screening of maintenance dredging projects within the Plan Area and assuring that such projects are consistent with this Plan. In addition, the City would assure compliance with permit conditions and all reporting requirements under the Regional General Permit and any other authorization for maintenance dredging in the Plan Area.

(2) The second part establishes a procedure by which various amounts of impact to eelgrass from maintenance dredging may occur with the assumption that natural recolonization will allow for recovery over time. However, at lower abundance levels of eelgrass, increasing direct actions will be undertaken to promote eelgrass recovery. The Tiers represent various acreage levels of eelgrass within the Plan Area.

(3) The third part establishes BMPs in order to minimize negative impacts and encourage eelgrass population growth, especially following periods when natural events may reduce eelgrass population levels.

(4) The fourth part establishes a program by which the City will implement methods to promote eelgrass growth and promote public education on eelgrass and includes measures to implement adaptive management as new information is developed.

The City has met with NMFS in the development of this Plan and has incorporated the Service's comments and recommendations into the Plan. The City has also met with the Los Angeles District of the Corps of Engineers, the Santa Ana Regional Water Quality Control Board, the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, and the California Coastal Commission during the development of this Plan. Comments received from these agencies have been incorporated into the Plan as well as the compliance with Special Condition 2 contained in the Coastal Development Permit 5-14-0200 as approved by the Commission in June 2015.

With approval from the federal and state permitting agencies, this Plan will be considered a special management plan area under the CEMP and will be used for maintenance dredging within the Plan Area. Applicants whose maintenance dredging projects qualify will reference the Plan when proposing work in areas containing eelgrass, and the resource agencies will use the Plan as a basis for compliance with eelgrass mitigation. The City will prepare annual reports on its progress in implementing the Plan and will maintain records of projects approved under the Plan.

ELEMENTS OF PLAN

CITY ASSUMES LEAD RESPONSIBILITY

The City will have responsibility for implementing the Plan and will comply with all reporting requirements to the permitting agencies. Applicants will be required to submit an application to the City to use the Plan as mitigation for impacts to eelgrass. The City will consider the nature of the project and area of eelgrass impact that would result from the routine maintenance dredging. If the City approves the applicant's use of the Plan, the applicant will reference the Plan in their regulatory permit application, including verification by the City certifying the work. For those projects covered under the Regional General Permit (RGP) issued to the City, the reporting and permitting will be undertaken as specified in the RGP.

The City's eelgrass survey and maps will replace the requirement for individual applicants to conduct eelgrass surveys and can be used in support of the agency regulatory approval process. Eelgrass impacts would be calculated by the City using GIS software-by overlaying dredge footprint data with the most recent eelgrass data collected during comprehensive biannual surveys. If eelgrass was present within a dredging footprint during the previous biennial survey, its presence at the time of dredging must be assumed and the size of the presumed eelgrass loss documented. That area shall be examined specifically during all following biennial surveys and the distribution and cover of eelgrass documented to determine recovery time.

The City will be responsible for tracking eelgrass distribution in the Plan Area based on the most recent survey completed prior to the proposed work and for reporting those impacts to the agencies in compliance with the RGP. In addition to the Tier level limitations, the City will not authorize more annual impacts of more than 1% of the total eelgrass found during harbor wide surveys conducted every four years. The City will report to the agencies when the dredging limit has been reached for the year.

The designation of the various survey areas is shown on Figure 1. The survey procedure is done using a SCUBA diver and GPS and is very accurate in terms of determining the distribution of eelgrass throughout the Harbor. Both eelgrass extent and turion density are recorded. These data are reported in the biannual survey results. During the initial six year period in which this Plan is in effect, the City will conduct a minimum of three comprehensive eelgrass surveys of the Plan Area. The first and third of these surveys will also cover the area outside of the Plan Area within the entire Newport Harbor. The first survey will begin no later than one year after the issuance of all permits authorizing the use of the Plan.

Eelgrass vegetation was mapped using a Global Position System (GPS) and a team of biologists consisting of a diver and a surface support biologist in a kayak. To assist in the

mapping process, an Ocean Technology Systems (OTS) surface-to-diver communications system was employed. Eelgrass depth ranges were recorded during this phase of the field operations. A Thales Mobile Mapper Wide- Area Augmentation System (WAAS) GPS/GIS Unit was employed to map eelgrass beds and small eelgrass patches. The estimated GPS error of the Thales Mobile Mapper unit, with post-processing differential correction is less than 1 meter with clear open skies; however, in some instances, the error was higher because the team was working near bulkheads, underneath piers, and between docks where a clear view of the sky was not always possible. In these instances, the error was estimated to be 1 to 3 meters.

The biologist-diver first located the beginning of an eelgrass bed and marked it with a yellow buoy. The surface support biologist working from a kayak then initiated tracking of the biologist diver with the GPS as the diver swam the perimeter of the individual eelgrass bed. Once the diver returned to the beginning point, the GPS polygon area mapping was terminated. Eelgrass patches that were too small to survey or located in difficult areas to obtain a GPS signal (i.e., behind docks/under piers) were referenced as a GPS "point" and a size of the eelgrass patch was estimated by the diver.

In order to assess eelgrass turion density, thirty (30) eelgrass turion counts were made at each of 15 stations throughout the study area by SCUBA-diving biologists that counted the number of live, green shoots at the sediment/shoot interface within replicated 0.07 square meter (sq m) quadrats. These counts were conducted along an underwater transect between the shallow-and-deep edges of eelgrass at each sampling site. Prior to conducting the survey, the team standardized their counting methods to ensure the accuracy of counts between different team members.

The survey data will be important in assessing the long-term trends in eelgrass within the Harbor as well as providing regional information to compare with other embayments in the southern California bight. Without the biannual survey, the agencies would not have information on the quantity of eelgrass in the Bay. Under site-by-site permitting, permitting agencies would not know if eelgrass trends were positive, stable, or trending towards significant loss. Natural variation in eelgrass abundance is large as has been seen in Morro Bay, but without knowing the trends occurring over time, it is hard to pinpoint the factors controlling its distribution or when specific problems may be arising to cause large scale declines. The survey data will provide the needed information to reduce maintenance dredging should declines in eelgrass abundance be observed. In addition, regional monitoring programs on subtidal habitats are desired, but hard to fund (SCCWRP 2010). The proposed biannual surveys funded by the City of Newport Beach will fill one critical gap for southern California estuaries.

Basis for City Responsibility for Surveys

Since 2003, the City has been conducting routine surveys throughout the harbor on eelgrass distribution and density (Table 2). The data have been entered into a Geographic Information System (GIS) Database maintained by the City's Harbor Resources Division. This information is among the most detailed long-term data set on eelgrass distribution available in Southern California. For portions of the northwestern harbor (e.g., Newport Channel west of Bay Island and portions of Lido Isle), no eelgrass has been found during any of the surveys, whereas in other areas, it thrives from year to year. The distribution of eelgrass in the Lower Newport Bay is related primarily to light availability and tidal flushing times. Those areas with the most rapid tidal flushing times and best light availability are most likely to be colonized by eelgrass.

Based on the detailed studies completed by the City's consultant, Coastal Resources Management (CRM), there are three eelgrass zones within the Lower Bay (Figure 2).

- **Stable Eelgrass Zone –** A zone where eelgrass distribution appears relatively stable from year to year. This zone is located primarily within the Lower Bay and includes the channel entrance, the southern and eastern portions of Balboa Island and Grand Canal, Corona del Mar, and lower Balboa Peninsula. This zone is also characterized by a tidal flushing time of less than 6 days, which contributes to the higher water clarity.
- **A Transitional Eelgrass Zone –** A zone where eelgrass is susceptible to year-to-year variation in extent and density. This zone is largely found in the central part of the Lower Bay in areas such as Harbor Island, Linda Isle, the northern and western portions of Balboa Island, and the northern side of the Lido Channel. This zone is characterized by a tidal flushing time of 7 to 14 days and is located in a zone that is influenced by turbidity from San Diego Creek discharge during winter months.
- **An Unvegetated Zone–** A zone where eelgrass has not been found or is rarely found. This zone is primarily within the western portion of the Lower Bay and also areas of the Upper Bay north of Castaways Park. These areas are characterized by a tidal flushing time of greater than 14 days.

The survey data provides a depiction of the eelgrass dynamics in the Lower Bay and, because of their detail, can be used as a substitute for the current site-specific survey requirements contained in the CEMP. The City will conduct these surveys once every 2 years.

Figure 1. Location of sampling areas within the shallow water eelgrass zone of Lower Newport Bay.

Table 2. City-Sponsored Shallow Water Eelgrass Surveys in Newport Harbor

Survey Dates	Eelgrass in the Plan Area (Acres)	Notes
December 2003 to August 2004	24.51	Largest shallow water eelgrass population recorded in the harbor to date. Water quality conditions ideal with low winter rainfall.
December 2006 to October 2007	18.87	Decline in eelgrass area, primarily around north Balboa Island, Harbor Island, Linda Isle, and Upper Newport Bay.
December 2009 to November 2010	16.20	Decline in transitional zones attributed to strong winter storms, which contributed to high turbidity.
March 2012 to April 2014	22.76	Overall increase in eelgrass observed in Stable and Transitional Zones and additional survey conducted in the deep channel

Figure 2. Location of Stable, Transitional, and unvegetated eelgrass zones based on CRM (2010).

TIER LEVELS BASED ON EELGRASS SURVEYS

The Tier level concept is an ecosystem-based approach designed to take advantage of years of data, research, and knowledge on eelgrass in Newport Bay. The Tier levels will allow for greater impacts to occur when eelgrass is most abundant and environmental conditions are favorable for its recovery into temporarily disturbed areas. As eelgrass abundance decreases due to natural variation, more active restoration actions are implemented with the goal of accelerating the recovery of eelgrass.

Combined with the eelgrass populations in other areas of the harbor, the limitations on eelgrass impacts under the Plan would allow for eelgrass to persist throughout Newport Bay, while accommodating maintenance needs arising from the Bay's other recognized beneficial uses such as navigation and recreation. BMPs that will promote eelgrass growth and establishment will minimize potentially deleterious consequences of maintenance projects via avoidance measures, and in the event the eelgrass declines below specific population levels, will promote the continued proliferation of eelgrass through seeding and other measures.

The Plan establishes Tier levels that determine the BMPs that will be implemented. The Tiers were established using the 2003-2014 survey data and assumed that the observations obtained can be described using a normal distribution. Tier 1 was determined by the acreage that represented the upper 40% of observations, Tier 2 by the middle 20% of observations, and Tier 3 by the lower 40% of observations. Tier levels are set independently for each of the eelgrass zones.

Tier 1 applies when the Stable Zone above 17.2 acres and the Transitional Zone is above 4.5 acres. Up to 5% of the eelgrass population may be temporarily impacted in the Stable zone (=0.84 acres[6]) and Transitional zone (=0.19 acres) using the baseline survey data. However, the total limit on annual eelgrass impacts cannot exceed 1% of the harbor wide survey (=0.88 acres).

Tier 2 applies if the shallow water eelgrass population, based on the most recent survey in the Plan Area, drops below 17.2 acres, but remains at or above 16.3 acres in the Stable Zone or at or above 3.1 acres in the Transitional Zone. In Tier 2, allowable temporary impacts to eelgrass will be set at 3 % of the average eelgrass present in each zone. Using the mean of the 2003 to 2014 survey data, the allowable impacts in the Stable Zone are 0.5 acres and 0.11 acres within the Transitional Zone.

[6] The allowable impacts in each Zone of the Plan Area has been determined by multiplying the mean of the eelgrass abundance determined from four surveys conducted between 2003 to 2014 by the appropriate percentage under the applicable Tier.

Tier 3 applies if the shallow water eelgrass population drops below the Tier-2 levels. During Tier 3, maintenance dredging resulting in any temporary impacts to eelgrass will require the applicant to mitigate pursuant to the CEMP, including retaining responsibility to meet the performance criteria after 5 years of monitoring. Five years of monitoring and reporting would be completed by the applicant independent of the City's biannual monitoring, and reporting by the applicant to the agencies on an annual basis for the five year duration of the required monitoring period. Consistent with the CEMP, if the mitigation success is not met after five years, the applicant (not the City) would be responsible for providing additional mitigation to meet the success criteria.

Based on the most recent survey (Appendix B) and the Tier levels established under this Plan, the Tier level starting in August 2015 for the Stable Zone is Tier 1 (19.3 acres in Stable Zone Plan area exceeds 17.2 acres) and for the Transitional Zone is Tier 2 (3.45 acres in Transitional Zone Plan area is within the range of < 4.5 to ≥ 3.1 acres).

In the future, the Tier levels and associated allowable impacts may be updated with subsequent survey information, but any change is subject to review and approval by the City and the permitting agencies based on data and information collected in Newport Bay. If additional impacts to eelgrass are proposed within the Plan Area, after the annual limit imposed at the specific tier level is reached, mitigation would be provided by the project proponent independent of this Plan and consistent with the CEMP.

Basis for Tier Level Approach for each Zone

The areas with stable eelgrass populations are influenced by ocean water as they are subject to the higher flushing rates in the portion of the Harbor nearest the inlet channel (Figure 3). As a result, they are less affected by turbidity reduction from inflow of the San Diego Creek into the Upper Bay. There has been little to no dredging for private docks within eelgrass areas during the period covered by the surveys; so, it is expected these numbers represent the baseline conditions.[7]

In the Stable Zone, the amount of eelgrass averaged approximately 16.8 acres for the Plan Area in the four survey periods with a 95% confidence limit of 1.9 acres.

[7] According to the dredging permit activity log maintained by the City, minimal to no dredging of eelgrass has occurred during this analysis period due to the difficulty and cost of completing mitigation associated with eelgrass impacts. So, it is assumed the eelgrass population as measured represents a natural variation from periods of high growth (2003 to 2004 data) and lower growth due to higher turbidity (most recent data).

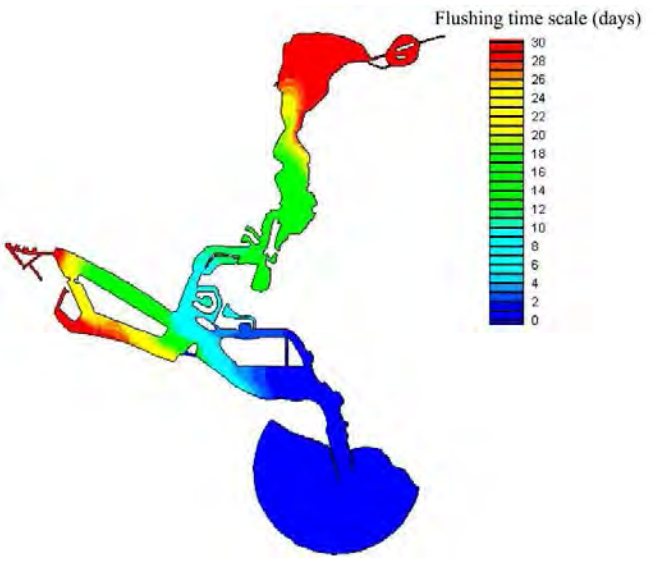


Figure 3. Tidal flushing in days for the Lower and Upper Newport Bay area. Everest Consulting (from CRM 2005).

The Transitional Zone is strongly influenced by reductions in light penetration and perhaps lowered salinities during normal to above normal rainfall years.[8] The significant decline observed from 2003 to 2010 is likely the result of higher rainfall years during the sampling events. Eelgrass in some areas within the Transitional Zone has disappeared during years of high runoff and low light penetration. This is particularly true when strong winter storms in 2009 to 2010 contributed to high turbidity throughout the Harbor. The cooler water temperatures observed in the summer of 2010 may have also stalled recovery by slowing growth (R. Ware, pers. comm.). During the most recent survey, rainfall was lower and therefore turbidity was reduced. For the Transitional Zones, the average within the Plan Area was 3.8 acres with 95% confidence limits of the mean at ± 2.6 acres. The variation observed over the four sampling periods is larger than that seen in the Stable Zones.

The inter-annual variation in the transitional areas contributes to most of the variation of shallow water eelgrass as this area is most influenced by variation on turbidity associated with outflows from San Diego Creek and Upper Newport Bay (CRM 2010). Primary emphasis on sustaining eelgrass populations in the Harbor should be placed on maintenance of acreage within the Stable Zone (from which seeds are likely produced to re-establish eelgrass in transitional zones).

[8] CRM has found that very small differences in mean light intensity can affect whether eelgrass will establish and grow at specific locations (CRM 2010). Based on light measurements taken in 2008 to 2009, CRM observed the mean light intensity in eelgrass occupied areas was 354 µmol m^{-2} s^{-1} compared to 294 µmol m^{-2} s^{-1}, and that generally light energy in eelgrass beds was greater by approximately 100-200 µmol m^{-2} s^{-1}.

In addition to restrictions on the amount of dredging that could occur within the Stable and Transitional Zones each year, the location of those impacts would be restricted. Because dredging requires substantial pre-project planning and the cost of dredging for small projects is high, adjoining landowners may wish to combine their efforts and conduct dredging over several properties. This may have an impact on the local population of eelgrass; therefore, it is proposed that no contiguous properties will impact more than 25% of the allowable annual eelgrass impacts under the Tier currently in effect for that Zone. Because there are some areas of the bay, such as Carnation Cove and portions of Balboa Island and Channel, where this restriction may present an economic hardship, especially as the eelgrass population increases, should any eelgrass impacts exceed these restrictions, written approval from NMFS and Coastal Commission would be obtained to exceed these levels.

Maintaining the eelgrass population at various Tiers

With a healthy eelgrass population, there will be ample seeds available in this well-mixed tidal system that most viable areas will be supplied with seeds naturally, such that seeding would be unnecessary. When eelgrass is in Tier 1, the dock owner has no mitigation responsibilities but the City institutes eelgrass seeding and planting activities proportional to the amount of routine maintenance dredging undertaken by dock owners and pursues an educational program to increase the understanding of the ecological importance of eelgrass and encourage practices that contribute to eelgrass health.

The City will begin an education program to assist property owners in coming to view eelgrass as a valuable ecological resource rather than a nuisance weed that impedes navigation and recreation.

If the shallow water eelgrass population in the Plan Area is within the Tier-2 level, the allowable impacts to eelgrass would decrease to 3% of the population within each Zone. In addition, the City will require those property owners who undertake maintenance dredging in the Stable or the Transition Zones to implement active regrowth efforts at the impact site by deploying seed bags or by using TERFS off their docks in the areas of suitable depth within their lot(s).

If the population falls within the Tier-3 level, any temporary impacts to eelgrass would need to be mitigated pursuant to the CEMP.

If population within the Plan Area remains in Tier 3 for two consecutive survey periods, the City will evaluate, in conjunction with the permitting agencies, the field data to determine if the cause is related to natural events such as consecutive heavy rainfall years. If no natural causes for this decline can be determined, the City will consider options to increase eelgrass habitat within the Harbor in consultation with the agencies.

BEST MANAGEMENT PRACTICES

The City will require the use of BMPs as part of the review process when owners propose maintenance dredging within the Plan Area appropriate to the tier level. Approvals determined by the City will be conditioned on individual property owner's compliance with the BMPs.

The type of dredging equipment would be determined by the contractor(s) on a per project basis; this flexibility is necessary given the variety to potential project locations, placement sites, and volumes. Dredging would be conducted on a performance-based requirement (e.g. dredge footprint and depths) that the contractor is required to follow, which would be confirmed through pre-and post-dredge surveys. Regardless of the method of dredging employed by the project, the contractor will be required to comply with the terms and conditions of the RGP 54.

Basis for the BMPs

The purpose of the BMPs is to avoid and minimize the temporary impacts to eelgrass to the extent practicable and, where possible, to implement measures to promote eelgrass establishment. The overall plan provides incentives to property owners and the City to promote eelgrass establishment, as it will reduce costs and time associated with the current permitting and mitigation requirements. The BMPs allow the City and the property owners to address maintenance needs while promoting eelgrass stewardship.

Depending on site-specific conditions, the BMPs would include the following:

- **When Shallow Water Eelgrass in the Plan Area is in Tier 1:**

    - **Avoidance Where Practicable –** The City will review proposed maintenance dredging projects to ensure avoidance of existing eelgrass beds is maximized to the extent practicable. Avoidance measures may include reducing the proposed dredging area or shifting the dredging area.
    - **City Restoration Actions** -- When eelgrass is in Tier 1, the dock owner has no mitigation responsibilities but the City will institute eelgrass seeding and planting activities proportional to the amount of routine maintenance dredging undertaken by dock owners.
    - **Educate Property Owners –** The City will develop a public education program on the importance of eelgrass beds and the reasons they should be protected, so boat owners and property owners view the establishment of eelgrass as a positive outcome. The program will likely consist of information on the City's web site and a fact sheet attached to permit application packages.

- **When Shallow Water Eelgrass in the Plan Area is in Tier 2:**

    - **Promote Population Growth –** After maintenance dredging is concluded for projects that impact eelgrass, the City will require the property owners to use either of the following means:

        - **Buoyed Deployed Seed Bags (BDSB) –** These will be used to improve seeding adjacent to the disturbed area (Pickerell et al. 2006; Boyer et al. 2008). This method will allow for natural re-seeding of the temporarily disturbed areas and will likely be more successful than transplanting adult plants, because viable seed will be spread throughout the area and will germinate and survive in those areas best suited for eelgrass. It does not require significant expertise, intensive and expensive site-selection studies, or the use of divers, all of which are needed for transplanting. Seeds may be collected from the area prior to disturbance or from donor beds in the Stable Eelgrass Zone.

        - **TERFS™** – These are designed to allow for the stable transplanting of adult plants and will be deployed by the property owners if sufficient suitable area is available in the area surrounding the dredging activity. This would allow for re-establishment within its most suitable habitat area. TERFS will be deployed by the property owner who undertook the routine maintenance dredging.

Over time and through biennial monitoring, the City will be able to determine those methods that are most effective. As part of the annual reporting commitment, the City will include an appendix that includes detailed images of areas that were previously dredged under the proposed RGP 54, which would allow the City and agencies to track the success and re-growth of eelgrass and the effectiveness of the best management practices (BMPs; such as buoyed deployed seed bags) applied during Tier 2. It is expected that BMPs will evolve or additional ones will be adopted over time, as the City continues its efforts to acquire more information about the ecology, light requirements, and seedling survival rates of eelgrass.

If the shallow water eelgrass population in the Plan Area is within the Tier-3 category for two survey periods, the City will undertake a rigorous adaptive management program. The City will examine the field data collected in conjunction with its survey program to determine if the decline is the result of natural causes, e.g. consecutive years of high runoff, or is caused by anthropogenic causes. The City will also work with the regulatory and resource agencies to consider more transplanting or seeding methods or creation of suitable

areas for eelgrass colonization. The permitting agencies will meet to discuss possible causes for the decline, determine actions that should be taken, and if necessary, reduce or cease maintenance dredging authorization under their permitting authorities until eelgrass recovery occurs.

PROGRAM TO PROMOTE EELGRASS GROWTH AND ESTABLISHMENT

The City will test eelgrass propagation methods in order to ensure eelgrass is maintained through the use and development of restoration techniques, such as BDSBs (Pickerell *et al.* 2006) and TERFS™ (Short and Coles 2001).

The City is committed to minimizing temporary impacts to eelgrass by individual property owners through BMPs in the Plan Area. The City has undertaken an extensive monitoring program within the Harbor to assess light levels, salinity, and temperature throughout the year. It is expected these data can be useful not only in explaining inter-annual differences in eelgrass populations but to also determine areas most feasible for methods that can best promote eelgrass growth.

The City will promote expanding eelgrass habitat within the Bay through the use of the following techniques:

- Use BDSBs to disperse seeds into Transitional Eelgrass Zone areas when population levels decline to promote more rapid recovery of eelgrass (Pickerell et al. 2006). BDSBs are mesh bags that contain inflorescences (with ripened seeds) that are deployed over the area where eelgrass has a potential to grow but has been eliminated by some natural cause such as seasonally low light levels caused by storm events. This method could also be used to improve eelgrass regeneration in areas temporally impacted by dredging that have suitable conditions for eelgrass growth. In San Francisco Bay, BDSBs have been found to also increase genetic diversity over transplant techniques (Boyer et al. 2008).

- Use TERFS to establish eelgrass in areas of high wave action but with suitable light and substrate conditions. The purpose would be to test the ability of TERFS to provide stable structures for the initial establishment of eelgrass in more wave-prone areas.

It is expected that these programs will be undertaken in Stable and Transitional Zones to determine their effectiveness.

INITIAL PROGRAM ACTIONS

The City will undertake several program actions once the Plan is approved by the permitting agencies. While eelgrass does re-establish itself rapidly in areas subject to temporary disturbance, some initial temporal losses may occur during the initial period of plan implementation. These measures will have the effect of promoting eelgrass growth in the Newport Harbor immediately upon approval of the management plan by the agencies and are in addition to the measures to be implemented as part of the overall plan.

The measures proposed include:

- An annual $10,000 contribution to the CoastKeeper or other appropriate non-profit organization over 3 years that will be directed toward a program to benefit eelgrass in Newport Bay[9]. In 2008, the Coastkeeper initiated a partnership with the Bay Back Science Center and the California Department of Fish and Game. It includes an educational program for life science and biology classes and provides teachers with training and classroom materials on eelgrass protection. The program includes an eelgrass cultivation and research program that is directed toward answering critical questions on the future conservation, management, and restoration of eelgrass in Newport Bay. Experimental tanks have been installed to test hypotheses on how best to establish eelgrass in the Upper Bay. The donation will be used to support these programs and to encourage the experimental transplantation of eelgrass in Newport Bay.

- The City will promote the use of dock designs that may improve light intensity below and adjacent to docks. While the City is not in a position to require that dock owners retrofit dock and piers, they can provide information to dock owners who are seeking changes or modifications on methods that could be employed that would improve dock design, such as translucent or grated deck materials, light concentrators, or other materials that may be suitable for use in areas where eelgrass is present. The City will work with NMFS and the California Department of Fish and Wildlife to identify those materials or modifications that have been proven effective and do not compromise safety and structural strength.

REPORTING AND ADAPTIVE MANAGEMENT

The City will prepare annual reports, due by July 1 (starting in 2016) of each year, on the activities undertaken to implement and manage the Plan. The report will document individual maintenance dredging projects that have been approved to use the Plan and the

[9] The City has already made its first contribution to the Coastkeeper to test various planting methods in the Upper Newport Bay.

amount of eelgrass that has been impacted during that year. The report will include: (a) estimates of the time required for eelgrass recovery with and without on-site restoration activities, (b) estimates of the total temporal loss of eelgrass due to dredging (acres and acre-years), (c) estimates of the total area of off-site eelgrass restoration accomplished, and (d) the net mitigation accomplished. The report will be submitted to the National Marine Fisheries Service, the Corps of Engineers, the Santa Ana Regional Water Quality Control Board, the California Department of Fish and Wildlife, and the California Coastal Commission.

Restoration undertaken by the City and Orange County Coastkeeper (with funding from the City) under Tier 1 and Tier 2, and restoration undertaken by dock owners under Tier 2, will be documented and reported annually, including time and duration of restoration activities and types of activities undertaken. If Orange County Coastkeeper restoration activities are funded through sources in addition to the City, annual reporting will document these additional funds and sources and include an estimate of the proportion of total restoration that can be attributed entirely to funding provided by the City. The annual reports will also evaluate the success of the restoration in terms of eelgrass bed size, cover, and turion density.

As new information is made available on eelgrass distribution and ecology in the Plan Area, the City will, in concert with agency review and input, may propose revisions to the Plan and the Tier levels. In addition, new technology related to eelgrass ecology will also be incorporated into possible revisions. The resource and permitting agencies will review any new proposals and will provide consent to implement changes.

As part of its reporting, the City will designate reference sites to be used for long term assessment of the eelgrass variation over time. The reference sites will be located within the Stable and Transitional Zones and will designated by the City in the first annual report. The City will provide the basis for its selection of these sites and report on the trends observed in these sites since 2003 to demonstrate that they reflect Harbor wide trends. For example, reference sites could be based the four 'clusters' of eelgrass distributions present within the Harbor (2 within the Stable Zone and 2 within the Transitional Zone) (see Figure 19 of CRM 2014). Four areas of approximately 300 ft long by 100 feet wide will be designated within the selected regions in which eelgrass populations will be tracked over time. Should a maintenance dredging activity occur within any of the selected reference areas, an alternate area will be selected. The eelgrass distribution within these reference sites will then be plotted over time to determine long-term trends and compared to Harbor wide trends in which dredging activities have occurred. Harbor wide trends will be considered similar to reference sites as long as the Harbor wide trends are no worse than the lowest performing reference site.

Following the review of the biennial eelgrass survey data, or should there be a net loss in eelgrass in the impacted areas of Newport Bay relative to the reference sites, the City, along

with other resource and permitting agency staff will work together to resolve implementation issues that were unforeseen when the RGP 54 and the Plan were developed. If, at any time, the permitting agencies determine that development authorized is causing adverse impacts to habitat which are not being mitigated, the City will be notified and suspend commencement of and/or authorization of any further dredging and/or disposal unless and until the City obtains approval of an amendment, as applicable, that allows for recommencement of development pursuant to any additional terms and conditions to address the unforeseen impacts to coastal resources.

The final report for the six-year trial period of the Regional General Permit 54 program and the Plan shall assess the net effect of dredging and restoration activities on the presence of eelgrass within the Plan Area in the context of natural trends. The City, using the biennial survey data and reference sites within the Plan Area that have not been affected by maintenance dredging or replenishment, shall report on the trends in eelgrass abundance over the permit period. Should reference sites indicate a decline in overall eelgrass abundance at the end of six years, the City, along with resource and permitting agencies, will evaluate the causes of such decline and use that information in assessing the success of restoration efforts undertaken by the City during the period of the Plan.

During Tier 3, applicants would be required to provide mitigation pursuant to the CEMP including meeting the success criteria after five years based on applicant sponsored annual monitoring. The City would not be responsible for providing additional mitigation during Tier 3 years for any shortcomings presented in the six-year summary report. Any changes to the eelgrass in the Plan Area will be compared to reference sites using procedures adopted in the CEMP or as used by the California Coastal Commission for the San Onofre Nuclear Generating Station wetland mitigation monitoring plan.

If, relative to the reference sites, there is a net loss in eelgrass in the impacted areas of Newport Bay at the end of the six years, the City, along with the resource and permitting agencies will evaluate the success of the mitigation efforts by the City and by dock owners throughout the bay. If, through these discussions, it is determined that there is a shortfall in the necessary mitigation to offset temporal or permanent losses of eelgrass, a revised Plan shall be prepared by the City to provide the necessary additional eelgrass mitigation. The revised Plan shall require separate review and approval by the permitting agencies.

OTHER CONDITIONS APPLICABLE TO THIS PLAN

1. If invasive algae (*Caulerpa taxifolia*) are found within the Plan Area, the City and anyone with a legal right to dredge or dispose of dredged material shall immediately (within 5 days) report it to the Executive Director of the Coastal Commission, the National Marine Fisheries Service, and the Surveillance Subcommittee of the Southern California

Caulerpa Action Team. The City and anyone with a legal right to dredge or dispose of dredged material shall not proceed with any dredging or disposal of dredged material in the Plan Area until the City has provided evidence to the Executive Director that all *Caulerpa taxifolia* discovered within the Plan Area has been eliminated in a manner that complies with all applicable governmental approval requirements, including but not limited to those of the California Coastal Act.

2. The demolition, repair and in-kind replacement of docks (including piers, gangways, floats, and piles), bulkheads, and piles with similar structures is excluded from the current approved Regional General Permit 54 program. These activities shall require a separate coastal development permit from the California Coastal Commission.

3. Eelgrass impacts as a result of beach replenishment or disposal of dredged material in front of an existing bulkhead are not covered under this Plan. If an unexpected impact to eelgrass occurs during disposal of dredged material, such impact shall be documented and reported to the Coastal Commission in the same manner that dredging impacts on eelgrass are documented and reported. If an impact was detected (as defined above), the report will include a summary of how the California Eelgrass Mitigation Policy will be complied with. Implementation of mitigation shall require a new coastal development permit unless the Executive Director determines that no amendment or new permit is required. The following implementation measures shall be applied:

i. If eelgrass was present within 15 feet (in any direction) of a potential dredged material disposal site (in any direction) at the time of the most recent comprehensive eelgrass survey, that site shall be assumed to support eelgrass and cannot be used as a disposal site;

ii. If eelgrass was present between 15-30 feet from a potential dredged material disposal site (in any direction) at the time of the more recent comprehensive eelgrass survey, then monitoring of the site for potential eelgrass impacts from disposal operations shall be required. Monitoring shall consist of pre- and post dredging transects placed perpendicular to the shoreline and spaced five feet apart which map the eelgrass bed. Enough transects shall be used to extend the length of the dredging footprint. Along each transect, the extent of eelgrass shall be measured. Any decrease in eelgrass extent along any transect (pre-dredging vs. post-dredging) will constitute an impact. The pre-dredging transects shall be conducted no sooner than 60 days prior to the start of dredging and the post dredging transects shall be conducted no later than 30 days following the completion of dredging.

Should the monitoring identify an impact to a mapped eelgrass bed as a result of beach replenishment disposal of dredged material in front of an existing bulkhead, then mitigation

consistent with the provisions of the California Eelgrass Mitigation Policy shall apply. An eelgrass monitoring report shall be submitted to the Army Corps of Engineers, National Marine Fisheries Service, and California Coastal Commission no later than 90 days following completion of disposal of dredged material on a beach or in front of an existing bulkhead(s).

4. Authorization to dredge and dispose of suitable material at an approved ocean or beach disposal site under this CDP/CC shall expire six (6) years from the date of issuance of the CDP/CC. Requests for development under this authorization shall be submitted for review and, if authorized by the Executive Director, the development shall be completed within the six-year period.

5. If there is any discrepancy between the language or interpretation of the final RGP 54 or the final Eelgrass Monitoring and Mitigation Plan and the approved coastal development permit/consistency certification, the language of the approved coastal development permit/consistency certification shall prevail.

ACKNOWLEDGEMENTS

This Plan was prepared by WRA, Inc., for the City's Harbor Resources Division. Dr. Michael Josselyn of WRA, Inc. was the primary preparer of the Plan. Larry Paul of Larry Paul and Associates, Don Schmitz, of Schmitz and Associates, Inc., Adam Gale of Anchor QEA, LLC, City of Newport Beach Harbor Commissioner Doug West and City of Newport Beach Harbor Resources Manager Chris Miller participated in the revisions of the Plan. Rick Ware of Coastal Resources Management, Inc, provided technical support for this Plan. The participation of the National Marine Fisheries Service during the review and revision of the Plan, especially that of Bryant Chesney, is greatly appreciated.

REFERENCES

Boyer, K.E., Wyllie-Echeverria, S., Cohen, S., and Ort, B. 2008. Evaluating buoy-deployed seeding for restoration of eelgrass (*Zostera marina*) in San Francisco Bay. Final Report. .

California Ocean Protection Council. 2006. "A Vision for Our Ocean and Coast. Five Year Strategic Plan." COPC, Sacramento, CA.

City of Newport Beach. 2010. Harbor Area Management Plan. Prepared for: Harbor Resources Division, City of Newport Beach. p. 99.

Coastal Resources Management (CRM). 2005. "Distribution and Abundance of Eelgrass in 2003-2004."

Coastal Resources Management (CRM). 2008. "Distribution and Abundance of Eelgrass in 2006-2007."

Coastal Resources Management (CRM). 2010. Results of the Second Newport Bay Eelgrass (*Zostera marina*) bay-wide habitat mapping survey: Status and Distribution between 2006 and 2008 and Oceanographic Conditions in Newport Bay Between 2008 and 2009. Prepared for the City of Newport Beach Harbor Resources Division. 126 pp.

Coastal Resources Management (CRM). 2014. Results of the Fourth Newport Bay Eelgrass (*Zostera marina)* Bay-wide Habitat Mapping Survey: Status and Distribution between 2012-2014. Prepared for the City of Newport Beach Harbor Resources Division. 63 pp.

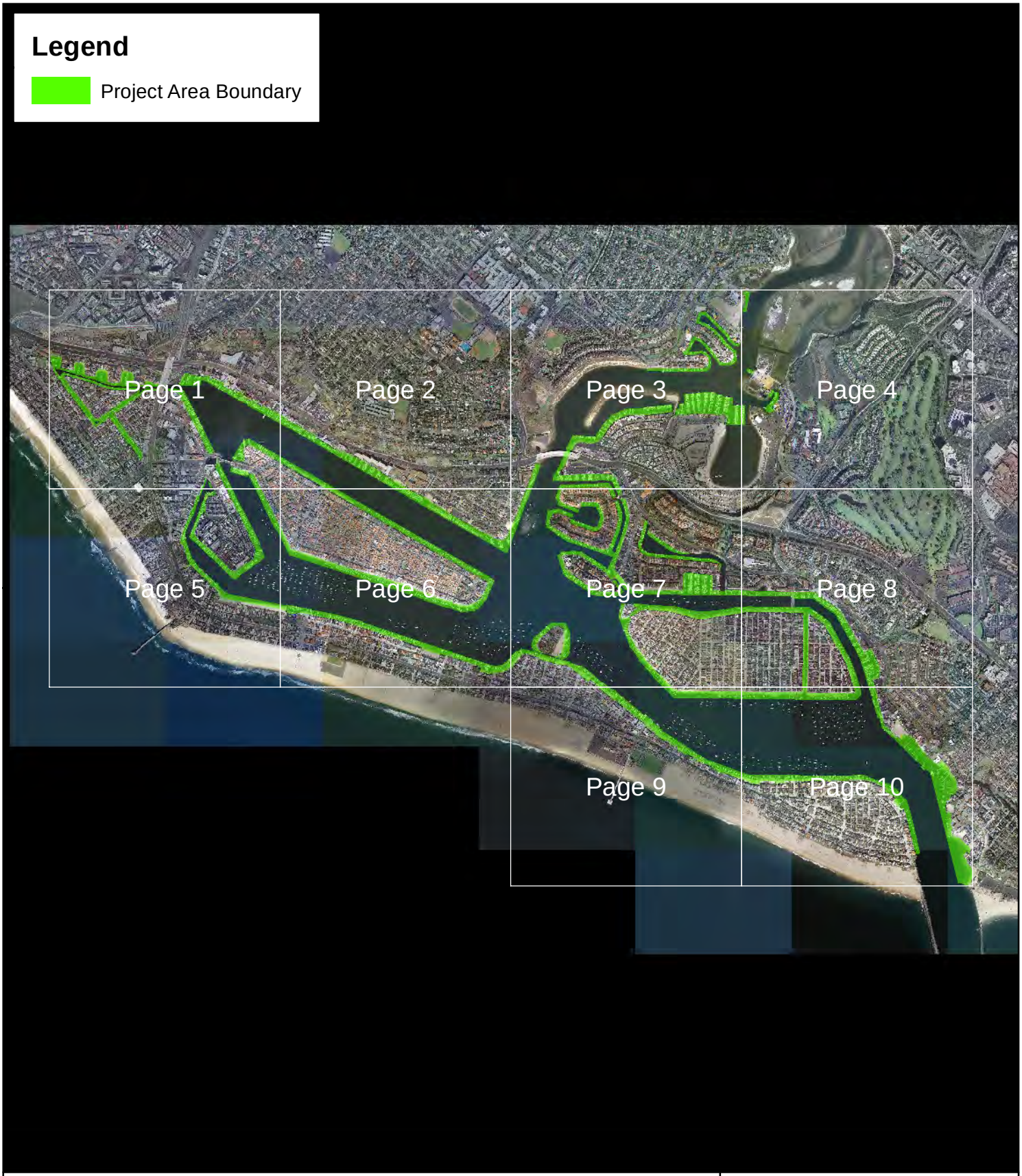
Council on Environmental Quality (CEQ). 2010. Final Recommendations of the Interagency Ocean Policy Task Force. July 19, 2010.

Pickerell, C., Schott, S., and Wyllie-Echeverria, S. (2006). "Buoy-deployed seeding: A new low-cost technique for restoration of submerged aquatic vegetation from seed." SAV Technical Notes Collection (ERDC/TN SAV-06-2), U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://el.erdc.usace.army.mil/sav/index.html

Sabol, B. Shafer, and Lord, E. 2005. Dredging effects on eelgrass (Zostera marina) distribution in a New England small boat harbor. US Army Corps of Engineers, Engineer Research and Development Center, Environmental Laboratory. Technical Report ERDC/EL TR-05-8 31pp.

Short, F.T. and R.G. Coles (eds.). 2001. "Global Seagrass Research Methods." Elsevier Science, Amsterdam. Page 473.

Southern California Coastal Water Research Program and Merkel Associates. 2010. Recommendations for a Southern California Regional Eelgrass Monitoring Program. Submitted to the National Marine Fisheries Service. 44pp.



Newport Beach Harbor Eelgrass Survey -
Index

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 33 of 44

City of Newport Beach
Orange County, California

N
W E
S

0 1,200 2,400
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook Index.mxd

Newport Beach Harbor Eelgrass Survey -
Page 1

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 34 of 44

City of Newport Beach
Orange County, California

N
W
E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd

Newport Beach Harbor Eelgrass Survey -
Page 2

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 35 of 44

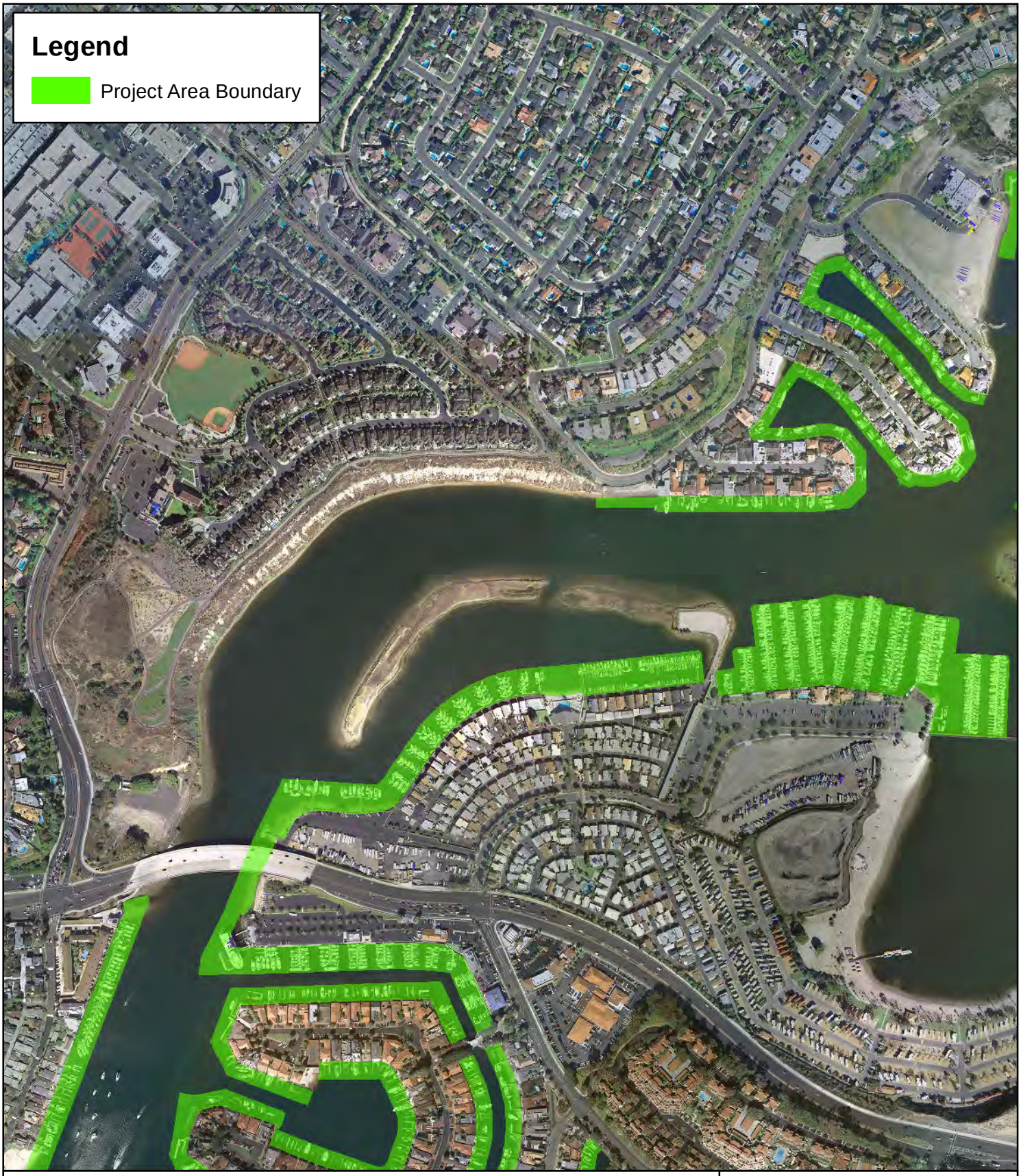
City of Newport Beach
Orange County, California

N
W
E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 3

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 36 of 44

City of Newport Beach
Orange County, California

N
W E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd

Newport Beach Harbor Eelgrass Survey -
Page 4

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 37 of 44

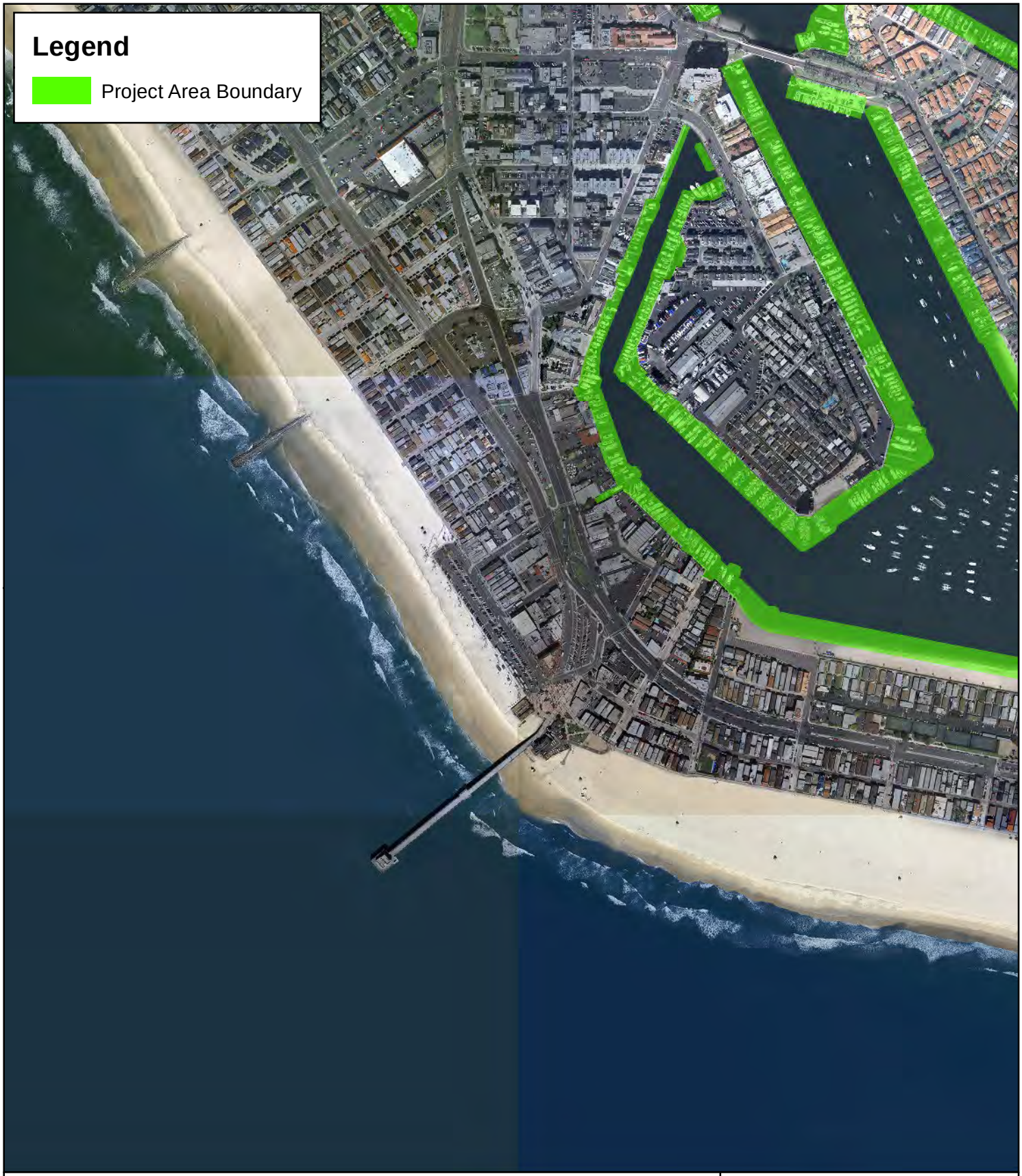
City of Newport Beach
Orange County, California

N
W E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 5

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 38 of 44

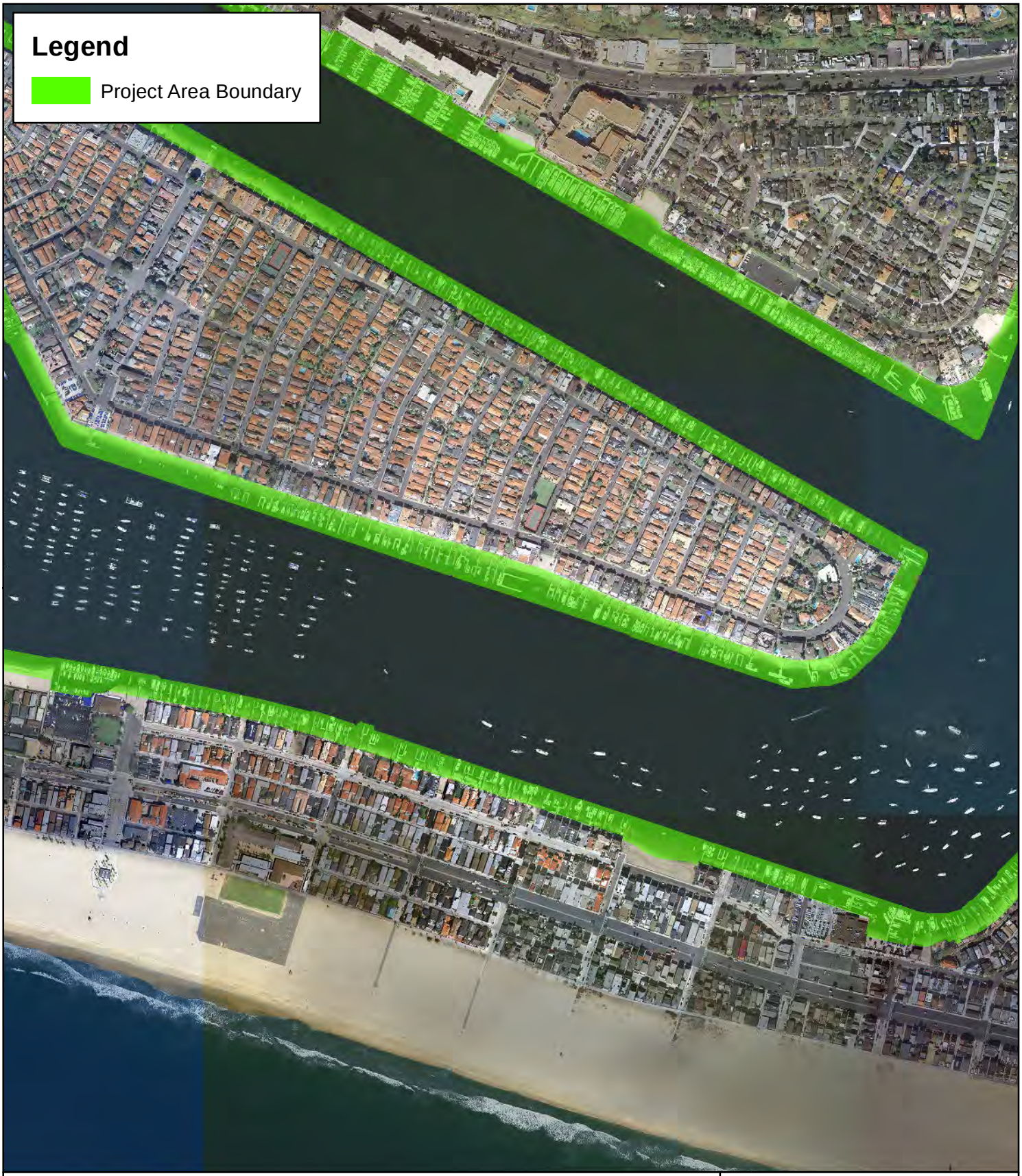
City of Newport Beach
Orange County, California

N
W E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 6

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 39 of 44

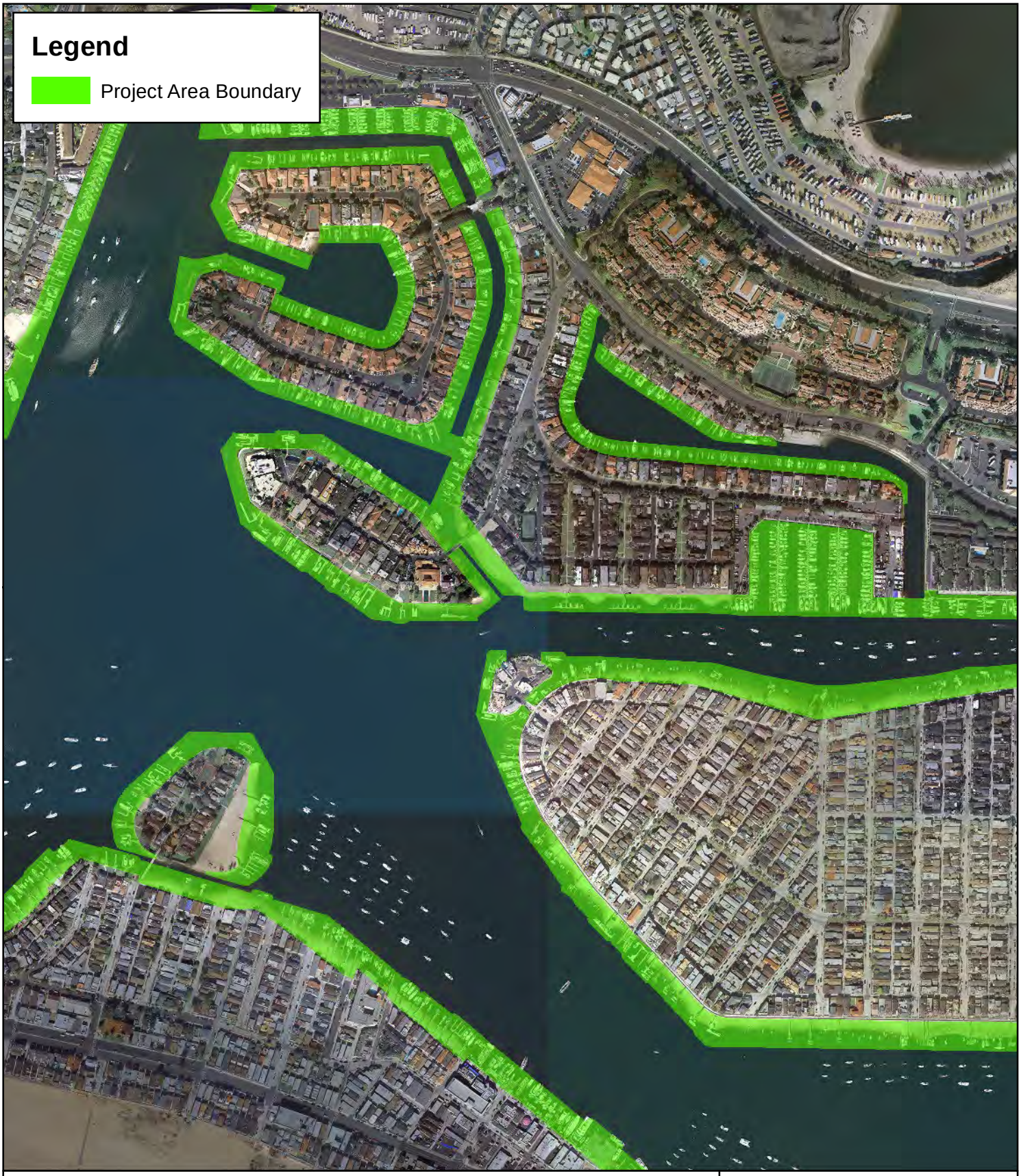
City of Newport Beach
Orange County, California

N
W
E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 7

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 40 of 44

City of Newport Beach
Orange County, California

N
W E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd

Newport Beach Harbor Eelgrass Survey -
Page 8

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 41 of 44

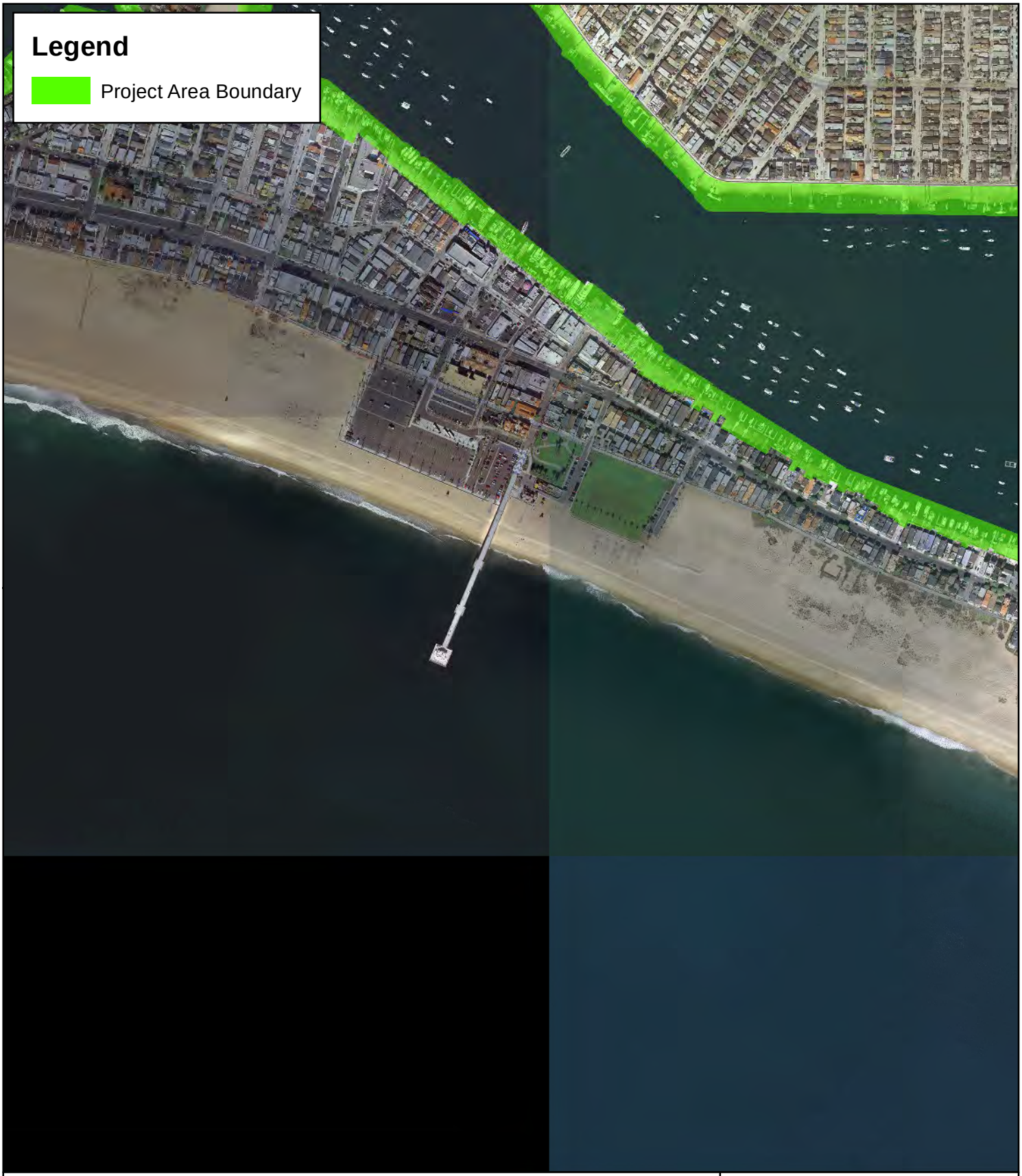
City of Newport Beach
Orange County, California

N
W E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 9

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 42 of 44

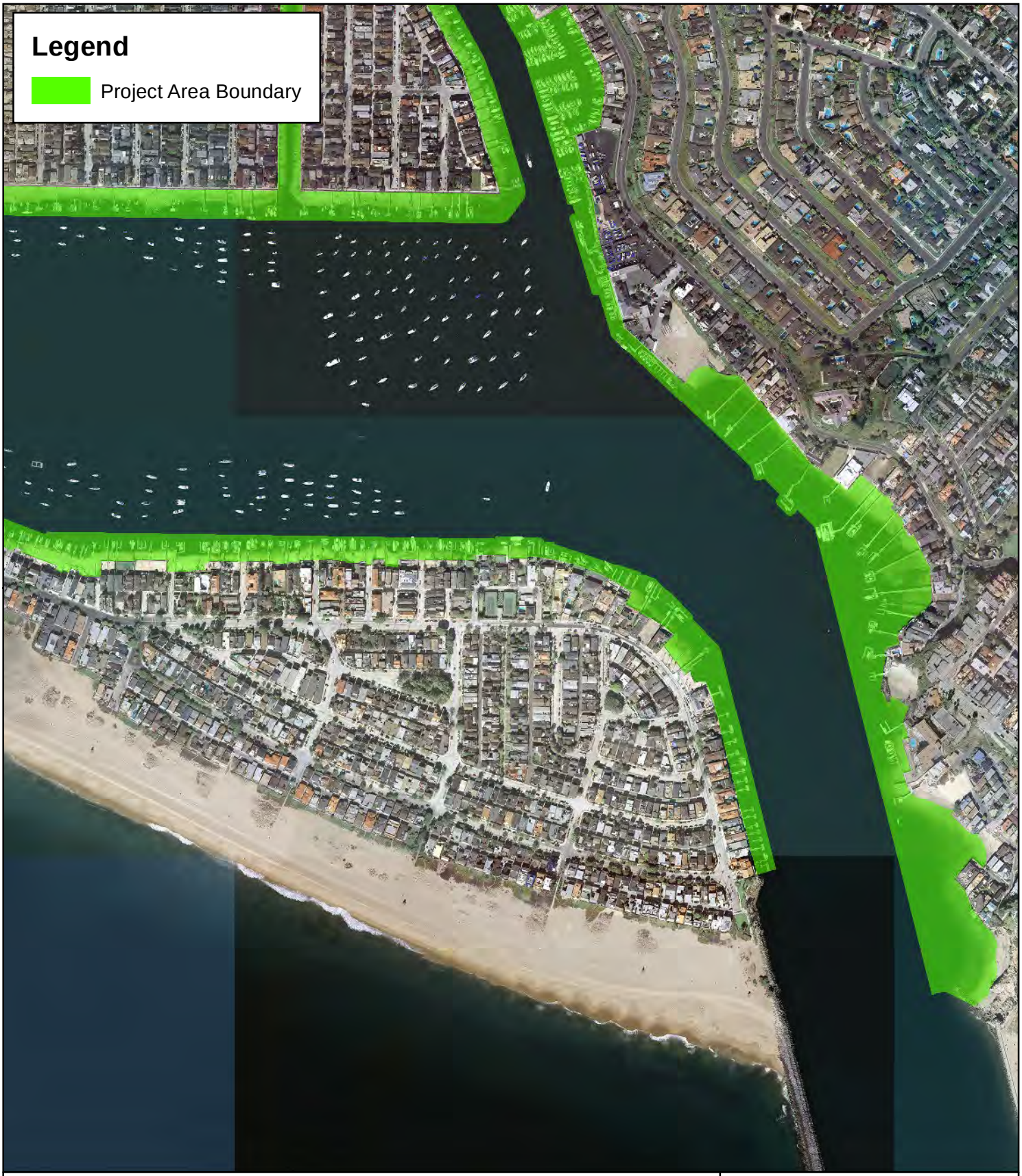
City of Newport Beach
Orange County, California

N
W
E
S

0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd



Newport Beach Harbor Eelgrass Survey -
Page 10

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 3 p. 43 of 44

City of Newport Beach
Orange County, California

N
W E
S
0 300 600
Feet

Date: May 2013
Map By: Chris Zumwalt, WRA, Inc.

Path: L:\Acad 2000 Files\17000\17169\gis\ArcMap\Eelgrass Mapbook.mxd

SUMMARY OF SURVEY DATA FROM 2003 TO 2014 FOR THE PLAN AREA

DATA FROM COASTAL MARINE RESOURCES

SHALLOW WATER EELGRASS WITHIN PLAN AREA	2003-2004	2006-2007	2009-2010	2012-2014	MEAN (acres)	STANDARD DEVIATION
STABLE ZONE						
Balboa Island/Collins Isle	4.16	3.43	2.40	3.34	3.33	0.72
Bay Island	0.11	0.05	0.04	0.27	0.12	0.11
Corona del Mar (Bayside)	8.36	8.13	8.49	9.90	8.72	0.80
East Balboa Peninsula	1.58	1.52	1.38	2.22	1.67	0.37
Grand Canal	0.9	1.14	0.62	1.06	0.93	0.23
Linda Isle Inner	0.05	0.51	0.30	0.98	0.46	0.39
Yacht Club/Basins	1.68	1.42	1.53	1.53	1.54	0.11
STABLE ZONE WITHIN PLAN AREA	***16.84***	***16.20***	***14.76***	***19.30***	***16.78***	1.90
TRANSITIONAL ZONE						
Balboa Island/Collins Isle	1.88	0.94	0.58	1.13	1.13	0.55
Bay Island	0.01	0.00	0.00	0.02	0.01	0.01
Bayshores	0.74	0.65	0.00	0.15	0.39	0.36
Castaways	0.00	0.00	0.00	0.01	0.00	0.00
Dover Shores	0.00	0.00	0.00	0.01	0.00	0.00
Dunes Marina	0.00	0.00	0.00	0.00	0.00	0.00
Harbor Island	2.22	0.62	0.40	0.90	1.04	0.82
Lido Isle	0.02	0.00	0.00	0.02	0.01	0.01
Inner DeAnza Peninsula	0.00	0.00	0.00	0.00	0.00	0.00
Linda Isle Inner	0.04	0.03	0.03	0.07	0.04	0.02
Linda Isle Outer	1.29	0.11	0.07	0.37	0.46	0.57
Mariner's Mile	0.23	0.07	0.07	0.31	0.17	0.12
North Balboa Channel and Yacht Basin	0.61	0.11	0.12	0.12	0.24	0.25
West Balboa Peninsula	0.03	0.03	0.01	0.10	0.04	0.04
Outer DeAnza Peninsula	0	0.00	0.00	0.00	0.00	0.00
Yacht Club/Basins	0.6	0.11	0.16	0.24	0.28	0.22
TRANSITIONAL ZONE IN PLAN AREA	***7.67***	***2.67***	***1.44***	***3.45***	***3.81***	2.70
TOTAL FOR PLAN AREA	**24.51**	**18.87**	**16.20**	**22.76**	**20.58**	3.75

CALIFORNIA COASTAL COMMISSION
SOUTH CENTRAL COAST DISTRICT OFFICE
89 SOUTH CALIFORNIA STREET, SUITE 200
VENTURA, CA 93001-2801
VOICE (805) 585-1800
FAX (805) 641-1732
WWW.COASTAL.CA.GOV

Final DRAFT

M E M O R A N D U M

FROM: Jonna D. Engel, Ph.D., Environmental Program Manager

TO: Mandy Revell, Coastal Program Analyst

SUBJECT: Newport Harbor RGP 54 Permit Renewal

DATE: September 29, 2021

Documents Reviewed:

City of Newport Beach. December 31, 2020. Regional General Permit 54 – Year Five Annual Report and Revised Tier Level Designations Based on 2020 Eelgrass Survey. Prepared for: Gerry Salas, U.S. Army Corps of Engineers; Marc Brown, Regional Water Quality Control Board; and Mandy Revell, California Coastal Commission.

Marine Taxonomic Services, LTD and Coastal Resources Management. December 25, 2020. 2020 Monitoring of Eelgrass Resources in Newport Bay, Newport Beach, California. Prepared for: City of Newport Beach Public Works, Public Works. Contact: Chris Miller, Public Works Administrative Manager.

Marine Taxonomic Services, LTD. December 20, 2018. 2018 Monitoring of Eelgrass Resources in Newport Bay, Newport Beach, California. Prepared for: City of Newport Beach Public Works, Public Works. Contact: Chris Miller, Public Works Administrative Manager.

Coastal Resources Management, Inc. July 10, 2017. 2016 Survey; Results of the Firth Eelgrass (Zostera marina) Mapping Survey: Status and Distribution in Newport Bay, Newport Beach California. Prepared for: City of Newport Beach Public Works, Harbor Resources Division. Contact: Chris Miller, Harbor Resources Manager.

Coastal Resources Management, Inc. January 2015. Results of the Fourth Newport Bay eelgrass (*Zostera marina*) Bay-wide Habitat Mapping Survey: Status and Distribution between 2013-2014. Prepared for the City of Newport Beach Harbor Resources Division.

Dixon, J. May 27, 2015. Memorandum: Newport Beach Eelgrass Plan. To: Zach Rehm, Coastal Analyst, California Coastal Commission.

City of Newport Beach. March 2015. Eelgrass protection and mitigation plan for shallow water in lower Newport Bay: An ecosystem based management program.

Newport Harbor in lower Newport Bay is a highly urbanized area where the shoreline is almost completely developed with residential and commercial structures. There is a high density of piers, docks and wharfs associated with private residences and marinas, both along the edge of the bay and on several constructed islands. As a result of continuous sedimentation, there is a periodic need to dredge both the navigational channels and the shallow areas where the piers are located.

Newport Harbor also supports a significant population of eelgrass (*Zostera* spp.) that currently covers about 112 acres of bay bottom much of it in the shallow waters around piers (74.44 acres of shallow water eelgrass habitat (SWEH) and 37.94 acres of deep water eelgrass habitat (DWEH)). Submerged aquatic vegetation, such as eelgrass, provides many important ecosystem services, has suffered widespread losses and degradation due to human activities, and is of worldwide conservation concern.

In 2015 the City of Newport Beach developed the Eelgrass Protection and Mitigation Plan (herein 'the Plan') wherein it assumed responsibility for monitoring and maintaining eelgrass within the harbor to simplify the mitigation requirements of individual dock owners. The "Plan Area" encompasses the portions of the harbor defined as: "The bulkhead to pierhead line plus 20 feet bayward, including those exceptions for structures that extend beyond this boundary as of 2013 in conformance with harbor development regulations or policy." Based on the eelgrass studies, the plan area has been divided into a "stable zone" where eelgrass is relatively abundant and does not fluctuate much from year to year, and a "transitional zone" where eelgrass tends to be sparse, patchy, and temporally variable.

Within each zone, three abundance "tiers" have been defined. Larger impacts (up to 5% of eelgrass in the zone) are allowed annually when eelgrass is abundant (Tier 1). Abundant eelgrass is defined as greater than or equal to17.2 acres for the stable zone and greater than or equal to 4.5 acres for the transition zone. Smaller impacts (up to 3% of eelgrass in the zone) are allowed when eelgrass is less abundant (Tier 2). Less abundant eelgrass is defined as less than 17.2 acres and greater than or equal to 16.3 acres for the stable zone and less than 4.5 acres and greater than or equal to 3.1 acres for the transition zone. Declining eelgrass (Tier 3) is defined as eelgrass abundance less than 16.3 acres in the stable zone and less than 3.1 acres in the transition zone.

The critical assumption underlying the plan is that dredging impacts to shallow water (≤ 12 ft) eelgrass within the defined Plan area are "temporary and minimal." The amount

of permissible impact is related to the size of the eelgrass population, with larger amounts of impact allowed when eelgrass is abundant and less impact allowed when the eelgrass population is smaller.

When eelgrass is in Tier 1, the dock owner has no mitigation responsibilities but the City institutes offsite eelgrass seeding and planting activities proportional to the amount of routine maintenance dredging undertaken by dock owners and pursues an educational program to increase the understanding of the ecological importance of eelgrass and encourage practices that contribute to eelgrass health. Under Tier 2, in addition to the activities of Tier 1, dock owners who have dredged must deploy seed bags or plant eelgrass within the dredged footprint to reduce the temporal loss. The Plan is only operational when eelgrass is relatively abundant. When eelgrass abundance falls below Tier 3 levels, mitigation as required by the California Eelgrass Mitigation Policy is the responsibility of the dock owner. The heart of the plan is mapping and estimating the density of eelgrass every two years in the shallow waters where piers are found and every four years throughout the harbor.

Since the City adopted and implemented the Plan in 2015, three biennial eelgrass surveys and reports (2016, 2018, and 2020) have been completed that mapped and estimated the density of eelgrass in both shallow and deep waters throughout the harbor. The shallow water eelgrass habitat (SWEH) mapped from 0.5 to -15' mean low low water (MLLW) has steadily increased according to the last four survey reports that document the following acreages: 42.35 (2014), 53 (2016), 58.18 (2018), and 74.44 (2020).

In 2016, 37.04 acres of eelgrass was mapped in the stable zone and 15.88 acres in the transition zone. In 2018, 29.95 acres of eelgrass was mapped in the stable zone and 28.10 acres of eelgrass was mapped in the transition zone. In 2020, 32.27 acres of eelgrass was mapped in the stable zone and 42.02 acres was mapped in the transition zone. In all three years, eelgrass acreages in both the stable zone and the transition zone clearly exceed the amount required for Tier 1 (stable zone - greater than or equal to 17.2 acres; transition zone - greater than or equal to 4.5 ac) where up to 5% of eelgrass in the stable and transition zones can be dredged in a year.

The Plan is working as documented by the eelgrass acreage Tier 1 status throughout the permit timeframe and the increasing acreage of harbor eelgrass in the last four biennial eelgrass survey reports. Additionally, the City of Newport Beach December 31, 2020 RGP 54 Year Five Annual Report demonstrates the cities commitment to the Plan. In the Five Year Annual Report the City walks through all the RGP 54 permit special conditions and reports on and meets all the permit special condition requirements. Therefore, I recommend that the Commission renew the City's dredging permit based on the positive SWEH eelgrass abundance results, the RGP 54 Year Five Annual Report results, and the assumption that the City will continue to fund biennial surveys of eelgrass within the Plan Area and will submit a Five Year Annual Report at the end of the next five years.

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 1 of 11

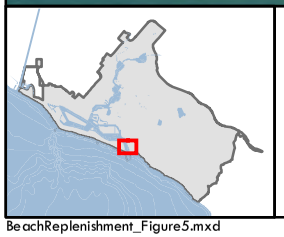
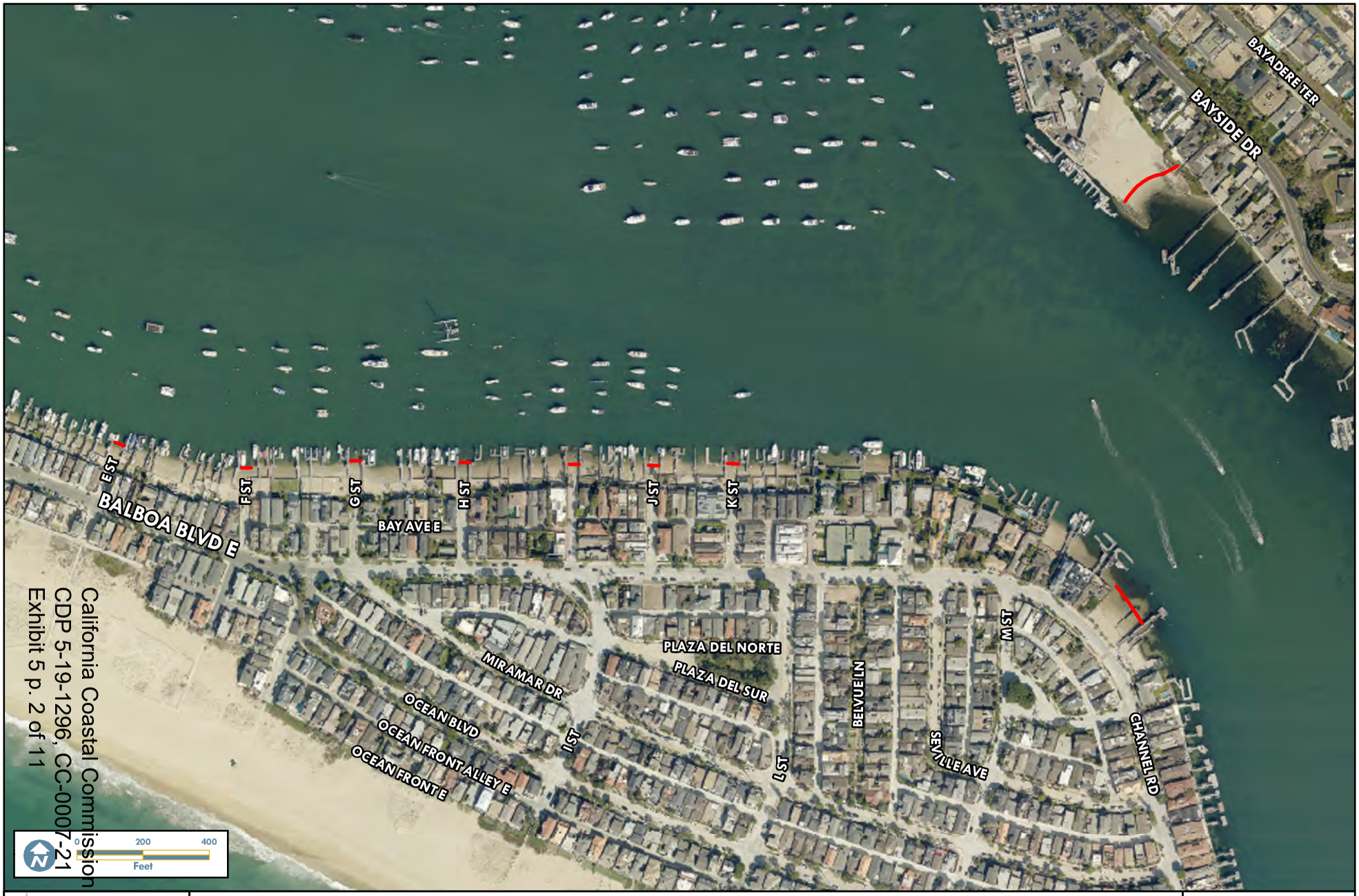


Figure A

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd



California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 2 of 11

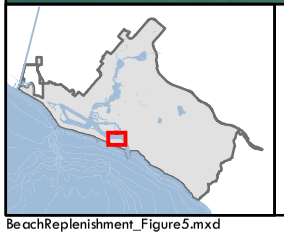
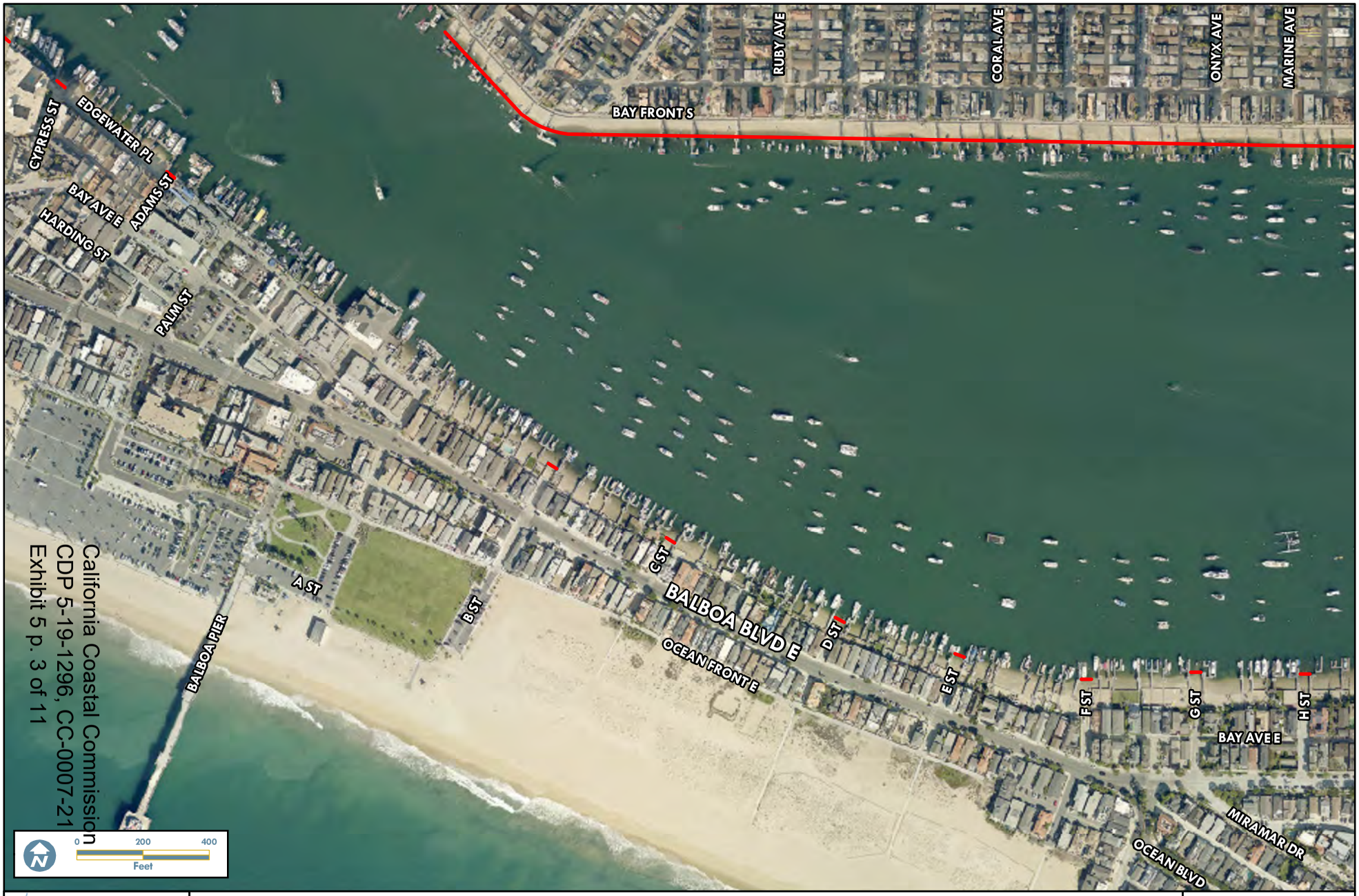


Figure B

NBGIS NEWPORT BEACH

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd



California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 3 of 11

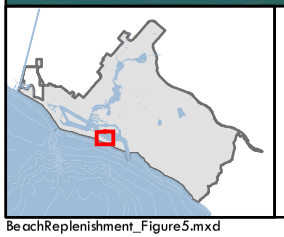


Figure C

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

City of Newport Beach
GIS Division
November 05, 2019

Figure D

BeachReplenishment_Figure5.mxd

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 5 of 11

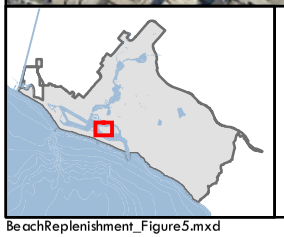


Figure E

NBGIS NEWPORT BEACH

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 6 of 11

Figure F

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

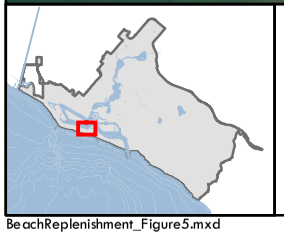
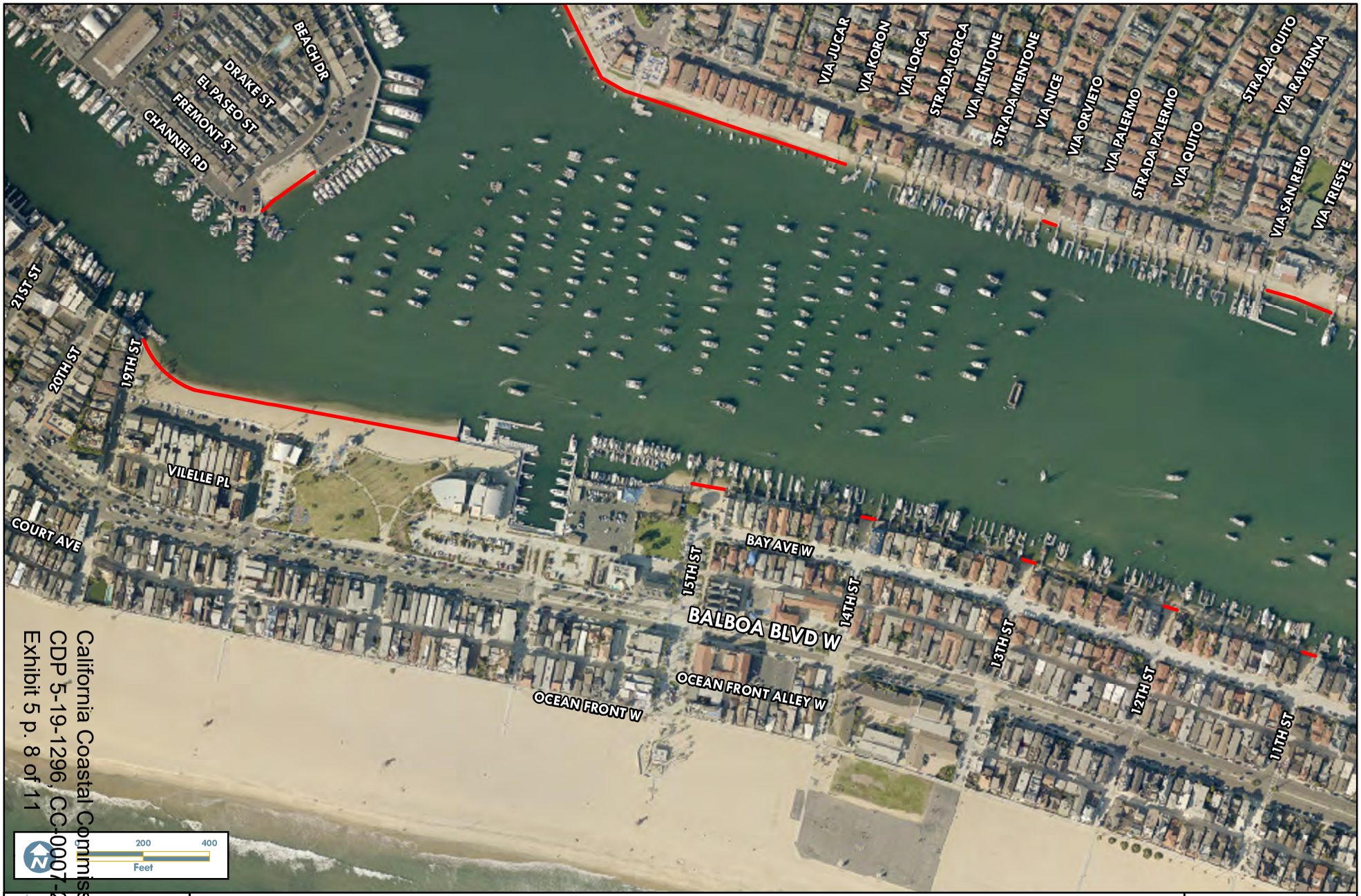


Figure G

City of Newport Beach
GIS Division
November 05, 2019

California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 7 of 11

BeachReplenishment_Figure5.mxd



California Coastal Commission
CDP 5-19-1296, CC-0007-21
Exhibit 5 p. 8 of 11

Figure H

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

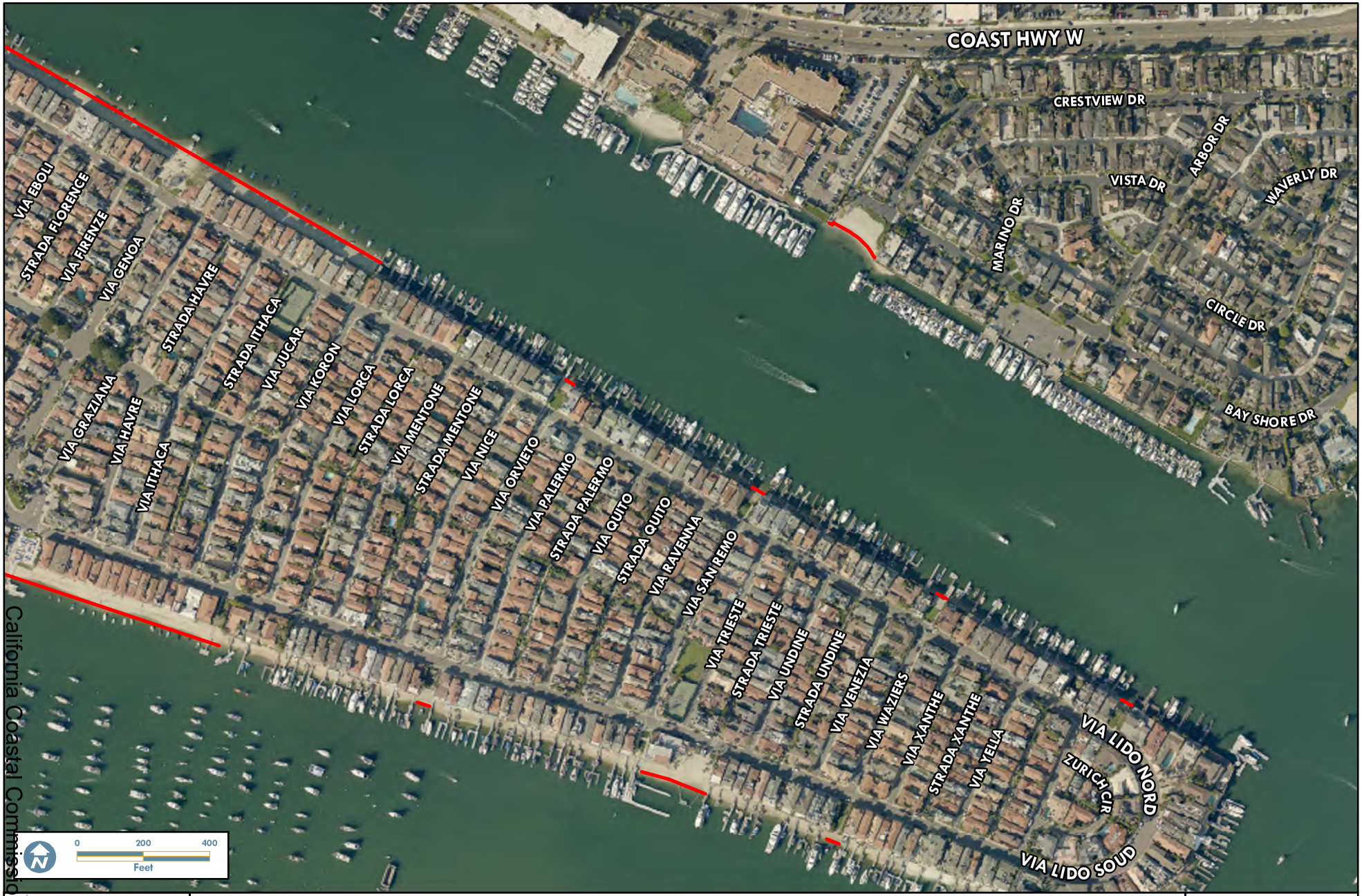


Figure 1

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

Figure J

NBGIS NEWPORT BEACH

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

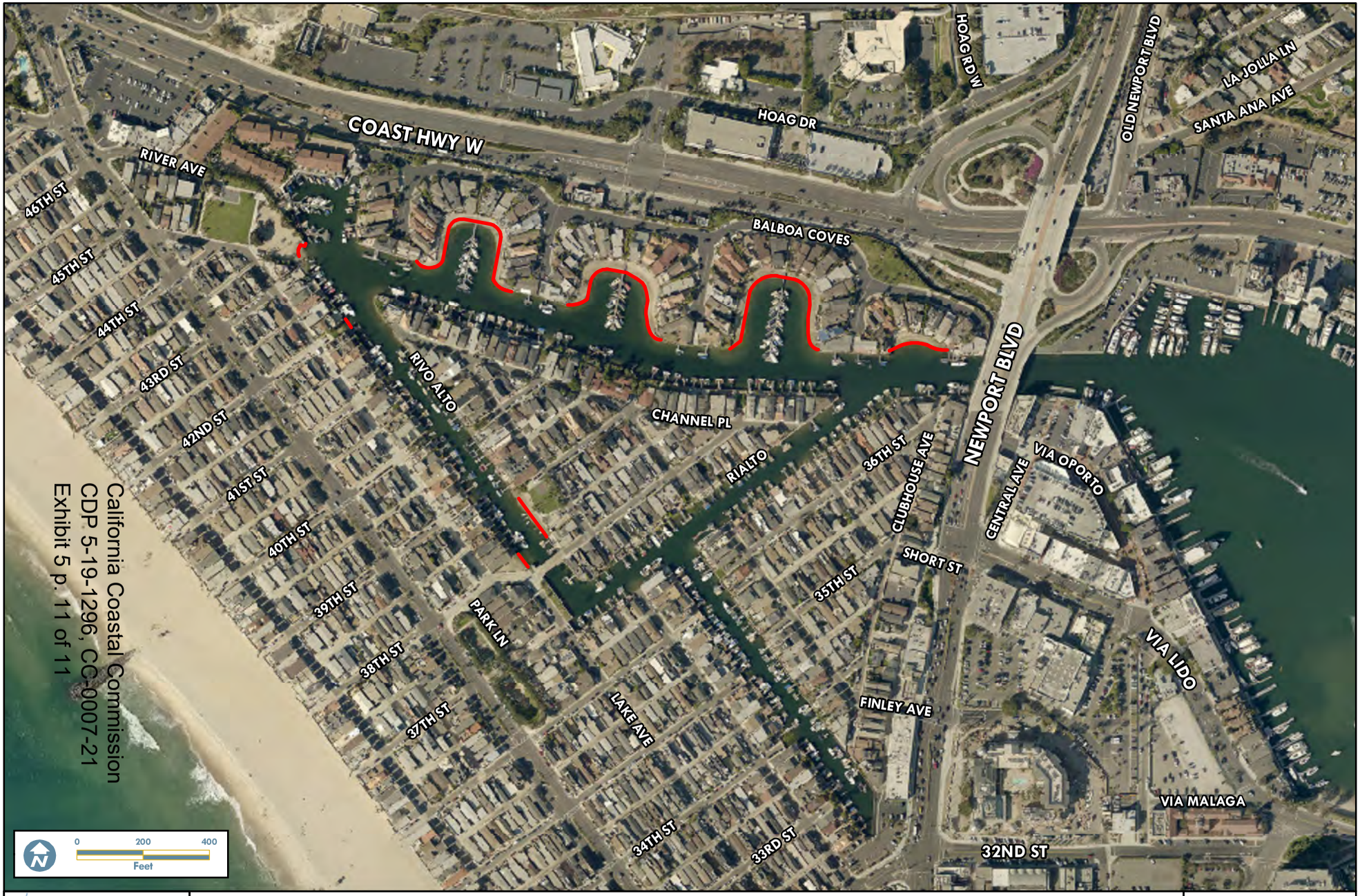


Figure K

City of Newport Beach
GIS Division
November 05, 2019

BeachReplenishment_Figure5.mxd

2015 LA-3 Ocean Dredged Material Disposal Site Monitoring

Table 2 a. **Summary of sediment chemistry for the LA-3 Ocean Dredged Material Disposal site and vicinity.**

		Survey Station:																	
		"Inside"									"Outside"							NOAA Screening	
Analyte	Units (dw)	Center	N-01	S-02	E-01	NW-01	NW-02	SW-01	NE-01-A	SE-01	N-04	N-04 DUP	N-06	S-03	S-06	W-04	W-06	ER-L	ER-M
Gravel	%	2.86	0.08	0.00	0.20	0.18	0.00	0.03	0.00	0.53	0.78	0.55	0.05	0.00	0.02	1.34	0.00	--	--
Sand	%	12.17	48.39	12.59	35.37	25.11	60.49	54.51	33.74	53.34	20.83	20.32	13.91	8.21	21.93	28.78	12.17	--	--
Silt	%	48.95	31.69	61.38	33.63	43.80	29.96	31.34	47.58	28.11	55.49	54.49	63.34	66.32	52.24	49.88	68.94	--	--
Clay	%	42.19	19.70	26.53	22.29	34.73	12.28	14.29	18.83	18.39	20.87	19.75	22.29	28.18	25.89	20.57	22.31	--	--
Total Organic Carbo	%	1.24	0.90	2.43	1.04	1.18	0.77	0.91	1.55	0.97	1.86	1.85	2.25	2.77	2.40	2.05	2.16	--	--
Arsenic	mg/kg	10.00	6.40	6.90	6.40	8.50	4.90	5.20	5.90	5.70	7.20	7.00	8.40	6.20	6.50	6.90	7.50	8.2	70
Cadmium	mg/kg	1.40	0.60	0.63	0.67	1.10	0.52	0.52	0.51	0.50	0.69	0.67	0.70	0.61	ND	0.56	0.58	1.2	9.6
Chromium	mg/kg	34.00	22.00	41.00	22.00	31.00	17.00	19.00	30.00	21.00	42.00	38.00	44.00	48.00	42.00	41.00	43.00	81	370
Copper	mg/kg	45.00	20.00	23.00	20.00	38.00	12.00	12.00	19.00	17.00	23.00	20.00	27.00	27.00	24.00	25.00	23.00	34	270
Lead	mg/kg	33.00	13.00	9.10	9.00	18.00	6.20	6.80	8.70	7.40	11.00	10.00	13.00	9.90	9.30	12.00	11.00	46.7	218
Mercury	mg/kg	0.26	0.09	0.09	0.07	0.14	0.04	0.05	0.08	0.06	0.09	0.09	0.10	0.09	0.09	0.13	0.10	0.15	0.71
Nickel	mg/kg	20.00	12.00	21.00	13.00	18.00	9.30	10.00	15.00	11.00	19.00	17.00	20.00	25.00	22.00	20.00	21.00	20.9	51.6
Selenium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--
Silver	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	3.7
Zinc	mg/kg	140.00	68.00	79.00	70.00	120.00	52.00	48.00	71.00	63.00	78.00	72.00	84.00	91.00	75.00	80.00	79.00	150	410
Dioxins - Total TEQ	ng/kg	3.80	1.23	1.26	1.36	3.24	0.87	1.42	1.42	1.48	0.74	0.73	1.23	0.77	1.68	2.01	1.91	--	--
Total DDTs	ug/kg	11.00	ND	ND	ND	20.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.58	46.1
Total Organotins	ug/kg	36.80	3.70	ND	2.90	16.10	ND	ND	ND	2.40	ND	ND	ND	ND	0.52	5.30	ND	--	--
Total PAHs	ug/kg	56.00	ND	3.00	ND	2.40	12.80	ND	ND	ND	36.00	15.00	ND	ND	11.50	ND	ND	4022	44792
Total PCB Congener	ug/kg	20.93	2.51	ND	0.74	6.05	1.14	1.13	1.53	0.55	2.32	1.36	4.02	1.29	1.75	8.87	2.51	22.7	180

"Inside" stations are both within the disposal site boundary AND on the dredged material deposit as determined by the SPI-PVP survey. "Outside" stations are both outside the site boundary AND off the dredged material deposit.

* Field duplicate sample from a separate grab taken at a different time at the same station

NW-01 is in the vicinity of the Interim LA-3 site identified and used by the USACE prior to the 1970s - before EPA was created and before the Marine Protection, Research and Sanctuaries Act and the associated Ocean Dumping Regulations were enacted - the current designated LA-3 site was shifted to the southeast of the expired interim site