

CALIFORNIA COASTAL COMMISSION

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6-24-0806 (Armed Services YMCA and SD Unified Port District)

February 6, 2025

EXHIBITS

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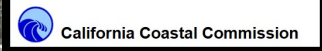
 = Barge Location

Legend



Earth
Navy, NGA, GEBCO

EXHIBIT NO. 1
APPLICATION NO.
6-24-0806
Vicinity Map



★ = Barge Location

Legend

Least tern nesting

Airport

Harbor Island

Shelter Island

N Embarcadero

Downtown


S Embarcadero

North Island

Coronado

Least tern nesting (off map)



EXHIBIT NO. 2
APPLICATION NO.
6-24-0806
Aerial View
 California Coastal Commission



Attachment D – Alternative Analysis

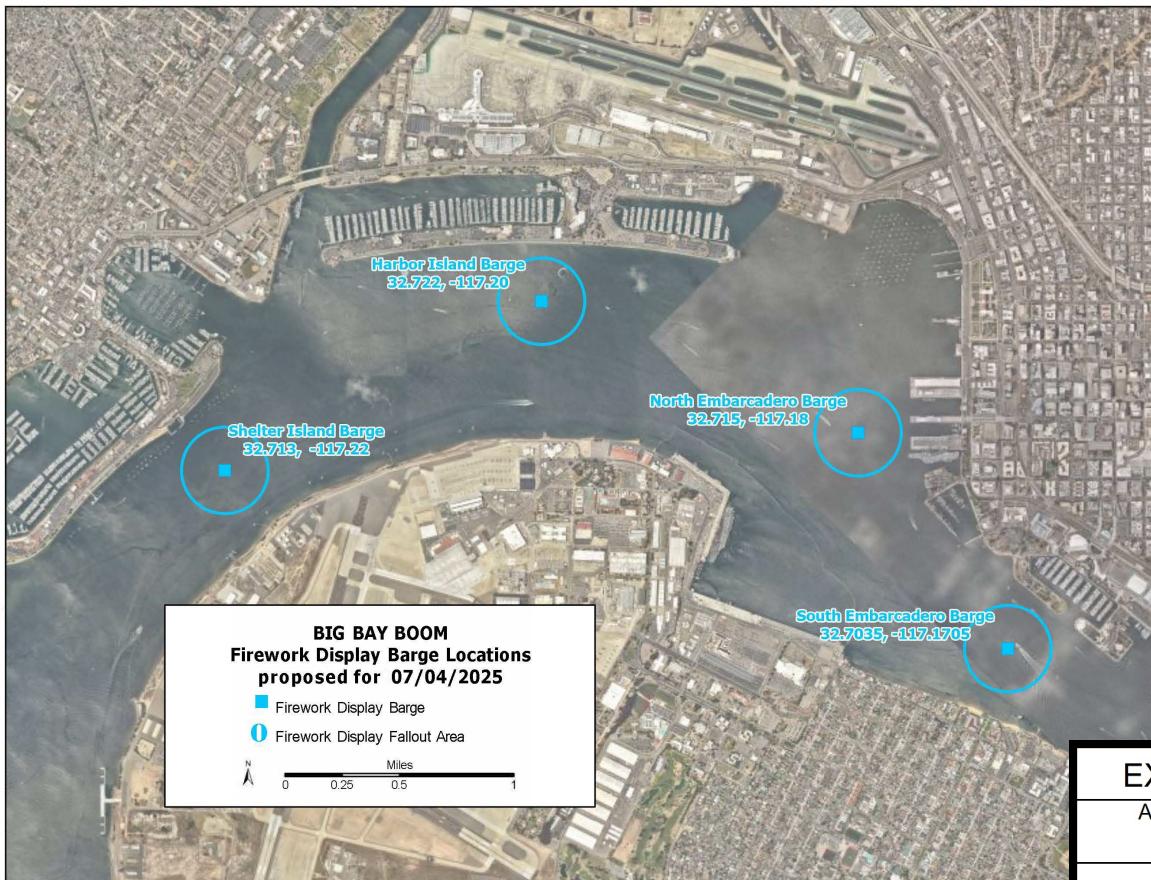
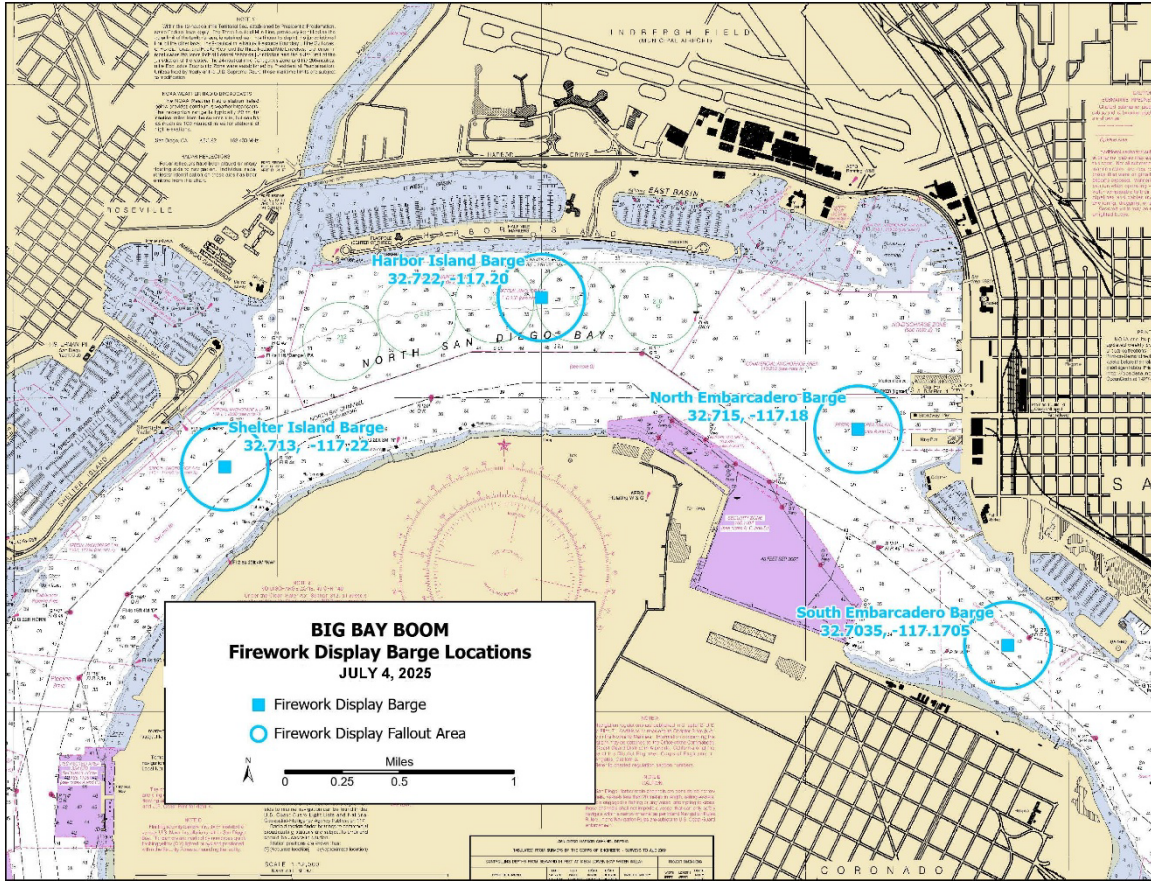


EXHIBIT NO. 3
APPLICATION NO. 6-24-0806
Barge Locations
California Coastal Commission

**Big Bay Boom will Comply with the Port of San Diego,
Regional Water Control Board and California Coastal
Commission Fireworks Display Ordinance and Environmental
Requirements**

Pyrotechnic Provider Responsibilities

Whoever is contracted to provide the pyrotechnic show must keep the weight of the total four (4) barge at 5,342 lbs. or less. This translates to no more than 1,335.5 lbs. for each barge. The maximum shell can be 10". Provider of pyrotechnics must meet the Port Fireworks Ordinance (see page 5) regarding content of copper and other restrictions.

The San Diego Fire Marshall needs to note to the Port that the barge fencing around the barge referred to in the Port Fireworks Ordinance is dangerous and would not approve of the show if fencing is required on the barges.

Big Bay Boom Confirmation of Sensitive Areas and Endangered Species

Prior to July 4th each year, Big Bay Boom will confirm the arrangement at the airport lease tern site by a qualified person to observe the nesting area and report activity before and during the Big Bay Boom to Port Environmental, US Fish & Wildlife, California Fish & Game and Big Bay Boom.

Big Bay Boom will also respond to any concerns of the California Fish & Game Department and the US Fish & Wildlife Department regarding the impacts of the Big Bay Boom event.

Big Bay Boom will publish for the public on the Big Bay Boom website the chart/map showing the sensitive areas where the public should avoid disturbing.

Location of the fireworks barges will be at least one (1) mile from any endangered species nesting or sensitive area.

EXHIBIT NO. 4

APPLICATION NO.

6-24-0806

Fireworks BMPs



California Coastal Commission

Page Two – Port of San Diego Fireworks Ordinance

Barge Clean-up (10-11:30pm, July 4) – Sam Bruggamma, Pyro Team & Steve Frailey, Pacific Tugboat Service Team

Clean-up on the barge shall begin as soon as the Fire Marshal declares the required safety observation period has ended (approximately 20 minutes after the show ends) and that it is safe to proceed.

Clean-up of the barge takes place while the barge is returning to its boatyard and continues upon the barges return to the dock. The perimeters of the barges are first cleared of loose debris. Brooms are used to gather all debris on the barges, shovels are used to place debris in plastic bags, and the bags are sealed and transported to the Pyro facility for weighing.

The time of the cleanup varies but usually takes approximately 20-40 minutes on each barge. All debris is categorized, photographed and weighed. The photos, weight and report will be sent to Sandy Purdon, Big Bay Boom, and the Regional Water Quality Control Board. Mr. Purdon will also include this information in a report to the Port Environmental Department, the Water Quality Control Board and the California Coastal Commission.

**Patrol Picket Boats Post Show In-water cleanup (9:50-10:30pm, July 4)
– Bill Edwards**

Big Bay Boom is responsible for providing two boats for each of the four barge locations (eight boats total) dedicated to in-water debris clean-up after the show. Start of debris search will begin 20 minutes after end of the show (fire marshal's cool down period) and will continue until 10:30pm. Each boat is to have 3-6 crew members looking for debris. Each boat is to have one pool skimmer and one trash bag (see below).

The in-water clean-up begins approximately 20 minutes' after the show ends because the San Diego Fire Marshal requires a "cool down" safety observation period before clean-up boats are allowed in the barge locations. The clean-up continues until the skippers determine they have covered the area sufficiently. The crews on the patrol boats cover the area around where the barges are located during the show and follow the wind direction to attempt to find other debris.

Page Three – Port of San Diego Fireworks Ordinance

The clean-up patrol boats return to their yacht club or marina and deliver the debris trash bags to the volunteer patrol boat leader, who delivers them to Mr. Purdon for weighing and photographing of the fireworks-related debris. Mr. Purdon shall write a report of the debris from all sources and provide that report to the Port District, RWQCB and California Coastal Commission.

Parks Cleanup (Midnight – 4am, July 5) – Port Operations

Port District personnel will pick up all debris at Port District parks.

Shoreline Cleanup (8-11am, July 5)–Cliff Elledge and Trash Clean Up Teams

Big Bay Boom is responsible for assembling and supervising teams to perform a clean-up of the shoreline. A minimum of 5 individuals/volunteers from non-profit organizations at each barge location are required to walk the shoreline of Shelter Island, Harbor Island, North Embarcadero and South Embarcadero on July 5 to collect fireworks debris.

Each individual/volunteer will have a trash bag and equipment to collect fireworks debris. The use of paddle boards and surf boards can be used. The fireworks debris will be collected and delivered to a common location where it will be weighed and photographed.

- Shelter Island shoreline
- Harbor Island shoreline
- North Embarcadero, including Tuna Harbor shoreline
- South Embarcadero, including Embarcadero Marina Parks North and South

Volunteers Provided to Operation Clean Sweep

Big Bay Boom will provide eight (8) people to help with the annual Operation Clean Sweep event.

Report by Big Bay Boom to Port, Regional Water Quality Control Board & California Coastal Commission

A report of all the debris weighed and photographed will be provided to the various oversight government agencies.

SAN DIEGO UNIFIED PORT DISTRICT

ORDINANCE 2892

ORDINANCE ESTABLISHING THE “SAN DIEGO UNIFIED PORT DISTRICT FIREWORKS DISPLAY EVENT ORDINANCE” AS ARTICLE 14 OF THE SAN DIEGO UNIFIED PORT DISTRICT CODE TO GOVERN EXISTING AND PROPOSED NEW FIREWORKS DISPLAYS

WHEREAS, the San Diego Unified Port District (District) is a public corporation created by the Legislature in 1962 pursuant to Harbors and Navigation Code Appendix I (Port Act); and

WHEREAS, Sections 4, 21, 35, 55, 56 and 87 of the Port Act grant the District broad general police powers, including the ability to enact ordinances to protect, preserve and enhance physical access to the bay, the natural resources of the bay, and the quality of water in the bay; and

WHEREAS, Section 55(a) of the Port Act requires the Board of Port Commissioners (BPC) to make and enforce all necessary rules and regulations governing the use and control of all navigable waters and all tidelands and submerged lands, filled or unfilled, and other lands within the territorial limits of the District; and

WHEREAS, Section 55(b) of the Port Act requires the BPC to regulate and control the anchoring, mooring, towing and docking of all vessels; and

WHEREAS, Section 55(c) of the Port Act authorizes the BPC to establish and maintain a harbor police and harbor fire protection within the territorial limits of the District; and

WHEREAS, Section 56 of the Port Act requires the BPC to make and enforce such local police and sanitary regulations relative to the construction, maintenance, operation, and use of all public services and public utilities in the District, operated in connection with or for the promotion or accommodation of commerce, navigation, fisheries, and recreation therein as are now vested in the District; and

WHEREAS, it is necessary for the District to regulate fireworks display events within San Diego Bay or the Imperial Beach oceanfront that require a discretionary action by the District or that are operated by the District’s tenants in order to encourage and promote commerce, navigation, fisheries, and recreation in and through its jurisdiction; and

EXHIBIT NO. 5
APPLICATION NO. 6-24-0806
Port Ordinance
No. 2892  California Coastal Commission

WHEREAS, the regulations included in this Ordinance are adopted pursuant to the authority granted to the District by the Port Act and the Port District Code to regulate the use and control of all navigable waters and all tidelands and submerged lands, filled or unfilled, and other lands within the territorial limits of the District, to regulate and control the anchoring, mooring, towing and docking of all vessels, and to enact ordinances to protect, preserve and enhance physical access to the bay, the natural resources of the bay, and the quality of water in the bay; and

WHEREAS, on May 25, 2017, the District has considered and certified a Final Environmental Impact Report pursuant to the California Environmental Quality Act, State CEQA Guidelines, and District procedures relative to the adoption of this Ordinance; and

WHEREAS, the District Clerk has caused notice to be duly given of a public hearing in this matter in accordance with law, as evidenced by the affidavit of publication and affidavit of mailing on file with the District Clerk; and

WHEREAS, the District has considered all comments received at the public meeting on May 25, 2017 prior to adoption of this Ordinance; and

WHEREAS, the District's approval of this Ordinance reflects the BPC's independent judgement and analysis.

NOW, THEREFORE, the Board of Port Commissioners of the San Diego Unified Port District does ordain as follows:

Section 1. That the San Diego Unified Port District Code is amended to add Article 14 regulating fireworks display events requiring a discretionary approval from the San Diego Unified Port District as follows:

ARTICLE 14 - FIREWORKS DISPLAY ORDINANCE

Section 14.01 – TITLE

The title of this article shall be known as the "San Diego Unified Port District Fireworks Display Event Ordinance."

Section 14.02 - PURPOSE

The purpose of this article is to establish a defined set of requirements and procedures by which the District and users of the District tidelands may continue to enjoy fireworks displays in and around San Diego Bay and the Pacific Ocean near Imperial Beach. Further, it is the intent of this article to protect the health,

safety and welfare of persons, property and the environment within the District's jurisdiction and to comply with federal, state and local laws and regulations governing the handling, possession, storage, loading, staging, launching and detonating of fireworks.

Section 14.03 – DEFINITIONS

For purposes of this article, certain words and phrases not otherwise defined in District Code section 0.03 shall be defined as follows, unless the context requires a different meaning:

“Alternative fireworks” means fireworks produced with new pyrotechnic formulas that replace perchlorate with other oxidizers and propellants that burn cleaner, produce less smoke and reduce pollutant waste loading to surface waters.

“Applicant” means a person who submits an application to the District for a permit pursuant to this article.

“Application” means the District's written form to be submitted by a person requesting a permit pursuant to this article.

“Barge” means a water vessel from which fireworks are launched or detonated.

“Best Management Practices” or “BMPs” means schedules of activities, prohibitions of practices, pollution prevention and educational practices, maintenance procedures, tools and other management practices used to prevent or reduce the discharge of pollutants directly to receiving waters to the maximum extent practicable. BMPs may include any type of pollution prevention and pollution control measure that can help to achieve compliance with this article.

“District” means the San Diego Unified Port District.

“District General Counsel” means the General Counsel of the District or her/his designee.

“Executive Director” means the Executive Director (President/CEO) of the District or her/his designee.

“Fireworks” means any device containing chemical elements and chemical compounds capable of burning independently of the oxygen of the atmosphere and producing audible, visual, mechanical, or thermal effects which are useful as pyrotechnic devices or for entertainment, including aerial shells, low-level comet or multi-shot devices or ground-level displays. The term "fireworks" includes, but is not limited to, devices designated by the manufacturer as fireworks, torpedoes, skyrockets, roman candles, rockets, sparklers, party poppers, paper caps, chasers, fountains, smoke sparks, aerial bombs, and fireworks kits.

“Fireworks Display Event” means the handling, possession, storage, loading, staging, launching or detonating of fireworks on the land or waters within the District’s jurisdiction for viewing by the public or any group of persons exceeding twenty-five (25) in number.

“Fireworks Operator” means a pyrotechnic operator licensed by the State of California, who by examination, experience and training has demonstrated the required skill and ability in the use and discharge of fireworks as authorized by the license granted, and who is responsible for supplying, staging, launching or detonating the fireworks used in a fireworks display event.

“Fireworks Organizer” means a person who proposes to conduct a fireworks display event and who is responsible for obtaining the funding and approvals for a fireworks display event and for contracting with a fireworks operator to produce a fireworks display event.

“Fourth of July Fireworks Display Event” means a fireworks display event that occurs annually on the Fourth of July to express patriotism and civic pride and to celebrate the signing of the Declaration of Independence of the United States of America.

“Non-Fourth of July Fireworks Display Event” means a fireworks display event that occurs on a date other than the Fourth of July.

“Operation Clean Sweep” means the annual cleanup event sponsored by the San Diego Port Tenants Association and District, among others, where volunteers remove trash and debris from San Diego Bay.

“Permit” means the District-issued authorization for an applicant to conduct a fireworks display event pursuant to this article.

“Person” means an individual, association, partnership, nonprofit organization, corporation, limited liability company, trustee, municipality, public agency or other legal entity, or the agent or employee thereof.

“Pounds” means the net explosive weight of fireworks.

“Salute” means an aerial shell as well as other pyrotechnic items whose primary effects are loud noise generated by detonation and flash of light.

“San Diego Bay Fourth of July Fireworks Display Event” means the annual fireworks display event which occurs on the Fourth of July at up to four (4) locations in northern San Diego Bay and is currently known as the “Big Bay Boom.” The San Diego Bay Fourth of July Fireworks Display Event will be referred to in this article as the Big Bay Boom.

"San Diego Water Board" means the California Regional Water Quality Control Board for the San Diego Region.

"San Diego Water Board General Permit" means California Regional Water Quality Control Board for the San Diego Region Order No. R9-2011-0022/NPDES No. CAG999002, General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Firework Pollutant Waste Discharges to Waters of the United States, including any updates and amendments thereto.

"Sponsor" means a person who contributes funds, services, or other forms of assistance to a fireworks organizer in support of a fireworks display event.

Section 14.04 – PROHIBITIONS

(a) It shall be unlawful for any Person to handle, possess, store, load, stage, launch or detonate Fireworks on land or water within District jurisdiction without first having obtained a Permit from the Executive Director as provided in this section. By signing said Permit, each Permit recipient acknowledges and agrees to comply with all of the applicable terms and conditions that may be specified in such Permit and this article.

(b) Any Person who receives a discretionary lease, permit, license or other entitlement for use or a contract, grant, subsidy, loan or other form of financial assistance from the District in connection with a Fireworks Display Event shall also obtain a Permit from the Executive Director as provided in this article. By signing said Permit, each Permit recipient acknowledges and agrees to comply with all of the applicable terms and conditions that may be specified in such Permit and this article.

Section 14.05 - PERMITS - APPLICATION

Whenever the privilege of doing any of the acts hereinbefore enumerated in this article requires obtaining a Permit from the Executive Director, the following procedure shall be followed:

(a) An application for a Permit shall be filed with the District not less than sixty (60) days before the date on which the Fireworks Display Event is proposed to occur.

(b) The application shall be in writing, in a form approved by the District, and shall include, at minimum, the following information: the Person who proposes to handle, possess, store, load, stage, launch or detonate Fireworks, including if applicable the Fireworks Organizer, Fireworks Operator and Sponsor of the Fireworks Display Event; the date, time and duration of the proposed Fireworks Display Event; the location(s) of the proposed Fireworks Display Event, including the loading, staging and launching sites; the total number of

pounds, shell sizes and types of Fireworks to be used; and the proposed event transportation and parking management plan for the Fireworks Display Event.

(c) The application shall include copies of the Applicant's Notice of Intent for coverage under the San Diego Water Board General Permit, the San Diego Water Board's Notice of Enrollment of the proposed Fireworks Display Event under said General Permit, and the Best Management Practices Plan approved by the San Diego Water Board for the proposed Fireworks Display Event.

(d) When the application is deemed complete, the Executive Director shall review the application and determine whether the proposed Fireworks Display Event complies with all of the requirements of section 14.07 (Permit – Conditions of Approval) of this article. If the proposed Fireworks Display Event complies with all of the requirements of section 14.07 (Permit – Conditions of Approval) of this article, the Executive Director shall issue a Permit.

(e) Each Permit issued shall state the date, time and location of the Fireworks Display Event for which it is issued, the name of the Person to whom it is issued and all mandatory conditions upon which the Permit is given.

(f) An application for a permit for a Fireworks Display Event at a location not identified in Section 14.07(a) of this article may be granted by the Executive Director provided that (i) environmental review for the proposed Fireworks Display Event has been completed and approved or certified by the District as required by the California Environmental Quality Act, Public Resources Code § 21000, et seq. prior to issuance of a permit and (ii) the applicant has obtained all other permits and approvals as required by law, including without limitation approvals and permits required under the California Coastal Act, Public Resources Code § 30000, et seq.

Section 14.06 - PERMITS – PUBLIC NOTICE

(a) Within five (5) business days after the issuance of a Permit pursuant to this article, the Executive Director shall give public notice of the issuance of such Permit by posting a copy of the Permit on the District's website.

Section 14.07 - PERMITS - CONDITIONS OF APPROVAL

All permits issued by the Executive Director shall be subject to the following terms and conditions:

(a) Location of Fireworks Display Events.

1. Fourth of July Fireworks Display Events shall occur only at the following locations:

- A. Big Bay Boom, at up to four (4) locations in northern San Diego Bay;
- B. Fourth of July Imperial Beach Fireworks, at one (1) location along the Imperial Beach Pier;
- C. Fireworks Over Glorietta Bay, at one (1) location in Glorietta Bay;
- D. Chula Vista Fourth of July, at one (1) location adjacent to the Chula Vista Bayfront; and
- E. National City Fourth of July, at one (1) location adjacent to the National City Bayfront.

2. Non-Fourth of July Fireworks Display Events shall occur only at the following locations:

- A. National Steel and Shipbuilding Company (NASSCO) shipyard, not to exceed two (2) displays per year along NASSCO Pier 12;
- B. U.S.S. Midway Museum, not to exceed twenty-three (23) displays per year on or adjacent to the U.S.S. Midway Museum;
- C. San Diego Symphony Summer Pops Concerts, not to exceed twenty (20) displays per year adjacent to Embarcadero Marina Park South;
- D. Our Lady of Rosary Church Annual procession, not to exceed one (1) display per year along Harbor Drive and at end of Grape Street Pier; and
- E. Chula Vista Bayfront, not to exceed two (2) displays per year adjacent to the Chula Vista Bayfront.

(b) Duration of Fireworks Display Events.

- 1. Fourth of July Fireworks Display Events shall not exceed twenty (20) minutes in duration.
- 2. Non-Fourth of July Fireworks Display Events shall not exceed ten (10) minutes in duration.

(c) Size of Fireworks Display Events.

- 1. Fourth of July Fireworks Display Events:

A. Big Bay Boom, not to exceed a cumulative 5,342 pounds of fireworks with shell sizes not to exceed 10 inches;

B. Fourth of July Imperial Beach Fireworks, not to exceed 456 pounds of fireworks with shell sizes not to exceed 10 inches;

C. Fireworks Over Glorietta Bay, not to exceed 397 pounds of fireworks with shell sizes not to exceed 10 inches;

D. National City Fourth of July, not to exceed 400 pounds of fireworks with shell sizes not to exceed 8 inches; and

E. Chula Vista Fourth of July, not to exceed 400 pounds of fireworks with shell sizes not to exceed 8 inches.

2. Non-Fourth of July Fireworks Display Events:

A. NASSCO shipyard, not to exceed 281 pounds of fireworks per display with shell sizes not to exceed 6 inches, or a cumulative total of 439 pounds of fireworks per year;

B. U.S.S. Midway Museum, not to exceed 235 pounds of fireworks per display with shell sizes not to exceed 6 inches, or a cumulative total of 1,759 pounds of fireworks per year;

C. San Diego Symphony Summer Pops Concerts, not to exceed 95 pounds of fireworks per display with shell sizes not to exceed 6 inches, or a cumulative total of 1,498 pounds of fireworks per year;

D. Our Lady of Rosary Church Annual procession, not to exceed 18 pounds of fireworks with shell sizes not to exceed 6 inches; and

E. Chula Vista Bayfront, not to exceed 114 pounds of fireworks per display with shell sizes not to exceed 8 inches, or a cumulative total of 228 pounds of fireworks per year.

(d) Fireworks Chemical Composition and Packaging.

1. Chemical Composition.

A. The Big Bay Boom Fourth of July Fireworks Display Event shall use Fireworks which contain no more than 0.32% copper (Cu) per pound of explosive firework material, unless the Applicant establishes in writing and to the satisfaction of the Executive Director that the total copper emissions from the proposed Big Bay Boom Fireworks Display Event will not exceed seventeen (17) pounds. Fireworks which do not conform to the foregoing

requirement, but were lawfully purchased prior to the effective date of this article, may be used for a period of six months after the effective date of this article.

B. All Fireworks Display Events shall use Alternative Fireworks produced with pyrotechnic formulas which replace perchlorate with other oxidizers and propellants that burn cleaner, produce less smoke and reduce pollutant waste loading to surface waters, unless the Applicant establishes in writing and to the satisfaction of the Executive Director that such Alternative Fireworks are not commercially available.

2. Packaging.

A. Prior to commencement of a Fireworks Display Event, the Fireworks Operator shall remove and properly dispose of all packaging, wrapping and labels (excluding labels mandated by State or Federal laws) from all Fireworks to be used in the event.

B. Fireworks that include a plastic outer casing or non-biodegradable inner components that make up more than five (5) percent of the mass of the shell or device are prohibited.

(e) Protection of Sensitive Species and Habitat. The following conditions shall apply to Fireworks Display Events that occur between February 15 and September 15 (i.e., avian breeding season) and are located less than one (1) mile from any federally or state-listed avian species nesting colonies:

1. Location. Fireworks Display Events shall be located not less than one (1) mile from any federally or state-listed avian species nesting colony unless the maximum size of shells used in the event is limited to eight (8) inches.

2. Salutes. Fireworks Display Events shall not use concussion type, non-color shells such as "salutes" or "reports" during the initial twenty-five percent (25%) of the duration of any display (e.g., within the first 5 minutes of a 20-minute display).

3. Security. For Fireworks Display Events with public viewing areas (i.e., parks, promenades, publicly accessible piers, and other similar facilities) that occur within one-half mile of unprotected (i.e., unfenced) federally or state-listed nesting colonies or habitat areas, the Fireworks Organizer shall provide a minimum of two professional security guards to direct persons away from and to discourage trespass into sensitive nesting areas or habitat during such displays. In addition, the fireworks organizer shall provide security patrols of the water area to enforce the existing restrictions on access to unauthorized areas during such fireworks display events in the South Bay.

4. Signage. For Fireworks Display Events with public viewing areas (i.e., parks, promenades, publicly accessible piers, and other similar facilities) that occur within one half-mile of nesting colonies or habitat areas for federally or state-listed species, the Fireworks Organizer, in cooperation with the District, shall post temporary signage along primary access points to sensitive nesting colonies and habitat areas to identify safe viewing locations, to educate visitors on locations of sensitive wildlife habitats, to prevent viewers from trespassing into sensitive areas and to encourage appropriate viewing behavior.

5. Education. Beginning not less than seven (7) days before Fireworks Display Events with public viewing areas (i.e., parks, promenades, publicly accessible piers, and other similar facilities) located within one-half mile of federally or state-listed nesting colonies or habitat areas, the Fireworks Organizer shall implement a public education program using daily announcements on social media, press releases, and information posted at parks, boat launch facilities, marinas, yacht clubs and other viewing locations, to educate potential viewers regarding appropriate viewing and boat docking areas, to discourage trespass into sensitive wildlife habitat, and to reminds viewers of appropriate viewing behavior in and near sensitive nesting colonies and habitat areas (e.g., appropriate disposal of trash, prevention of illegal fireworks, and safe boating procedures).

(f) Best Management Practices. Fireworks Display Events shall implement the following BMPs for Fireworks Display Event preparation, discharge and clean-up:

1. Fireworks Display Events on barges shall be set up at a loading facility in accordance with the requirements and under the supervision of the municipal fire department with jurisdiction over the event. Barges shall be inspected for leaks and other potential safety issues. Idling time for delivery trucks and loading equipment shall not exceed three (3) minutes and all such trucks and equipment shall be shut down when not in use.

2. Fireworks shall be brought to the barge and loaded in their U.S. Department of Transportation (DOT)-approved shipping cartons. Fireworks shall be encased in paper to prevent spillage of loose compounds. All packaging material and debris, including fuses, wires, shipping cartons and other wrapping, shall be properly disposed of in trash receptacles as the Fireworks Display Event is set up. Unless prohibited by the municipal fire marshal with jurisdiction over the Fireworks Display Event, barges shall be equipped with a fire-retardant debris barrier that extends six feet (6') in height, with openings no larger than ¼ inch, around the perimeter of the Fireworks launch area to contain debris.

3. Wires from the electric match placed in the Fireworks fuse shall be secured to avoid strain (such as wrapped around nails that are on the racks, tied to the racks, or tied to the mortar) to prevent wires from being pulled

out and falling into the water. Wire cables connected to computer firing equipment modules shall also be properly secured to ensure they remain on the barge during the Fireworks Display Event.

4. Once the Fireworks are prepared for launch, all trash and debris shall be removed from the barge while it is at the loading facility and prior to the barge being moved into position. No loose material shall be allowed on the barges during the Fireworks Display Event.

5. Following the Fireworks Display Event and upon expiration of any safety period required by the municipal fire marshal with jurisdiction over the Fireworks Display Event, the Fireworks Operator shall pick up all loose material on the barge, including all trash and debris resulting from the discharge of the Fireworks, to prevent it from being discharged into the water while the barge is underway.

6. Upon return to the loading facility, the Fireworks Operator shall clean the barge of all Fireworks related material and shall photograph and properly dispose of all Fireworks trash and debris. Unexploded Fireworks and related components shall be collected and disposed of by the Fireworks Operator in accordance with all applicable regulations. Fireworks Operators shall photograph the barge prior to and after cleaning.

7. Following the Fireworks Display Event and upon expiration of any safety period required by the municipal fire marshal with jurisdiction over the event, the Fireworks Organizer shall provide cleanup crews and boats to conduct sweeps of the fireworks detonation zone to gather any floating debris from spent Fireworks using hand held fishnets, pool skimmers, or other similar equipment.

8. The morning after the Fireworks Display Event, the Fireworks Organizer shall conduct another sweep of the fireworks detonation zone and quays, piers and docks adjacent to the fireworks detonation zone to remove Fireworks trash and debris. The Fireworks Organizer shall collect, bag, weigh and photograph all trash and debris collected prior to its disposal.

9. The morning after the Fireworks Display Event, the Fireworks Organizer shall perform a cleanup of the shoreline using crews of not fewer than five persons per barge on the shoreline adjacent to each barge location. Each crew member shall be equipped with trash bags and a trash grabber. The Fireworks Organizer shall collect, bag, weigh, and photograph all trash and debris collected prior to its disposal.

10. Within ten (10) business days after a Fireworks Display Event, the Fireworks Organizer shall provide the Executive Director with the photographs and written evidence of the weight of the Fireworks trash and debris

collected pursuant to subdivisions (5) through (9) above. If the dry weight of the Fireworks trash and debris collected is less than fifty percent (50%) of the net weight of fireworks launched during the Fireworks Display Event, the Fireworks Organizer shall offset the remaining amount by providing a crew of not fewer than two (2) persons for each barge or other launch site used in the Fireworks Display Event to participate in the next scheduled "Operation Clean Sweep" or other District-sponsored clean-up event prior to the end of the calendar year to recover trash and debris from San Diego Bay and/or the Imperial Beach Oceanfront.

11. For all Fourth of July Fireworks Display Events and for Non-Fourth of July Fireworks Display Events which are advertised to the public, the Fireworks Organizer shall double the number of trash receptacles at major viewing areas prior to each fireworks display event; trashcans shall be emptied and parks and viewing areas shall be cleaned following the event.

(g) Eelgrass Avoidance and Mitigation. For Fireworks Display Events with launching sites located in shallow water with the potential for eelgrass to occur, fireworks barges shall be held in place by tugboats and shall not require temporary moorings. To the extent practicable, barges shall be located in unvegetated deep water channels outside of eelgrass beds. Pre-event and post-event eelgrass surveys shall be completed to identify the distribution of eelgrass to assist tug operators and to assess any impacts to eelgrass that may occur. Through a pre-event training, tug operators shall be made aware of shallow eelgrass and instructed not to use high thrust in the vicinity of eelgrass beds. If an unanticipated impact to eelgrass occurs, this impact shall be mitigated by replacing the eelgrass at a ratio determined by the California Eelgrass Mitigation Policy.

(h) Event Transportation and Parking Management Plans. For all Fourth of July Fireworks Display Events and for Non-Fourth of July Fireworks Display Events which are advertised to the public, the Fireworks Organizer shall prepare and submit an event transportation and parking management plan (ETPMP) to the Executive Director for approval as part of the Application, which shall be designed to ensure safe and convenient access to public viewing areas while limiting conflicts between transportation modes and reducing impacts on surrounding transportation facilities to the maximum extent feasible. The ETPMP shall take into account anticipated attendance, existing transportation and parking facilities, and other concurrent public events in the surrounding areas, and shall include but is not limited to the following:

1. Transportation management strategies, including but not limited to, a public awareness program, traffic management and enforcement, incident management, and public transit and alternative modes of transportation management, which shall be implemented for the Fireworks Display Event; and

2. Parking management strategies, including but not limited to a public awareness program, coordination with parking vendors, off-site parking arrangements, designated areas for taxi and rideshare pick up/drop off, promotional programs with rideshare vendors, joint event ticketing programs with public transit agencies, and expanded shuttle operations.

(i) Compliance with San Diego Water Board General Permit.

1. Prior to the Executive Director's issuance of a permit pursuant to this article, the Applicant shall demonstrate that it has applied for coverage and has been enrolled under the San Diego Water Board General Permit.

2. The Applicant shall comply with all applicable terms, conditions and Best Management Practices required by the San Diego Water Board General Permit, which shall be incorporated into and considered in the terms, conditions and Best Management Practices of any permit issued by the Executive Director pursuant to this article.

3. The Applicant shall submit to the District copies of all applications, plans, reports and other documentation required by the San Diego Water Board General Permit, including without limitation the Notice of Intent, Fireworks Best Management Practices Plan, Public Fireworks Display Log and the Public Display of Fireworks Post Event Report, within the time required for the submission of such reports to the San Diego Water Board.

(j) Compliance with Other Required Permits: Prior to the Executive Director's issuance of a Permit pursuant to this article, the Applicant shall demonstrate that it has obtained and shall comply with all other permits and approvals required by federal, state and local laws and regulations including, without limitation, such permits and approvals as are required by the United States Coast Guard, California Coastal Act, the District Code, including Article 10 (Stormwater Management and Discharge Control), and the fire marshal of any city which has jurisdiction over all or any part of the activity allowed under said Permit.

(k) Compliance with Laws: The Applicant shall comply with any and all applicable rules and regulations promulgated by the District, including without limitation the District Code, the Chula Vista Bayfront Master Plan Settlement Agreement and Natural Resources Management Plan, and with the laws, rules and regulations of the United States of America and the State of California, and of any department or agency thereof, and with the applicable ordinances, rules and regulations of any city which has jurisdiction over all or any part of the activity allowed under said Permit. The Applicant's failure to comply with any applicable law, ordinance, rule or regulation shall be cause for immediate revocation of said permit and for the denial of applications for future Permits.

(l) Indemnity: The Applicant shall indemnify and hold harmless the District, its board, officers and employees, from any and all claim of loss, liability or damage arising out of the Fireworks Display Event, including but not limited to the issuance of the District Permit, or in connection with the handling, possession, storage, loading, staging, launching or detonating of Fireworks by the Applicant, its officers, employees, contractors, agents or other representatives, howsoever caused, whether such loss, liability or damage results, either directly or indirectly, from the acts, omissions or negligence of the Applicant, its officers, employees, contractors, agents or other representatives, in connection with the handling, possession, storage, loading, staging, launching or detonation of Fireworks pursuant to said Permit.

(m) Insurance: The Applicant shall file with the Executive Director, in a form approved by the District General Counsel, a policy of public liability and property damage insurance, in such amounts and form as the Executive Director may specify, indemnifying the District, its boards, officers and employees, as their interest may appear under the terms and conditions of said Permit. The Permit shall not become effective until after such policy of insurance has been received by the District.

(n) Performance Bond: For public Fireworks Display Events with over 500 spectators the Applicant shall post a faithful performance bond, in a form approved by the District General Counsel, or in lieu thereof the equivalent in cash, in an amount sufficient in the opinion of the Executive Director to cover costs associated with the Fireworks Display Event allowed under the permit, including without limitation the costs of providing security for the protection of sensitive species and habitat, and cleaning up and removing debris, rubbish and trash. The permit shall not become effective until after such faithful performance bond, or cash in lieu thereof, has been posted with and received by the District.

(o) Mitigation Measures: All permit applications shall be reviewed by the District for consistency with the Mitigation Monitoring and Reporting Program (MMRP) from the Final Environmental Impact Report for the San Diego Bay and Imperial Beach Oceanfront Fireworks Display Events Project, as certified by the Board of Port Commissioners, and all applicable mitigation measures from the MMRP shall be identified as required conditions of the approved permit issued by the District.

Section 14.8 – GENERAL PROVISIONS

(a) Preemption. The provisions of this article do not apply where any federal or state law regulates the handling, possession, storage, loading, staging, launching or detonating of Fireworks if the federal or state law preempts local regulation or the federal or state law is more restrictive.

(b) Severability. If any provision of this article or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or applications of this article which can be given effect without the invalid provisions or application, and to this end the provisions of this section are severable.

(c) Cost Recovery. The Applicant shall pay a fee to the District for the cost of services and administrative acts of the District incurred in processing a permit application.

Section 14.9 – ENFORCEMENT

Any person who violates this article or who fails to comply with the terms and conditions of a permit issued pursuant to this article shall be subject to punishment in accordance with District Code section 0.11, General Penalty, and section 0.13, Permit Violations.

Section 2. The administrative record for the District's approval of this Ordinance is maintained at the District's Administrative Building located at 3165 Pacific Highway, San Diego, CA 92101. The custodian of records is the District Clerk.

Section 3. This Ordinance shall take effect on the 31st day from its passage by the Board of Port Commissioners.

APPROVED AS TO FORM AND LEGALITY:
GENERAL COUNSEL


By: Assistant/Deputy

2892

PASSED AND ADOPTED by the Board of Port Commissioners of the San Diego Unified Port District, this 25th day of May, 2017, by the following vote:

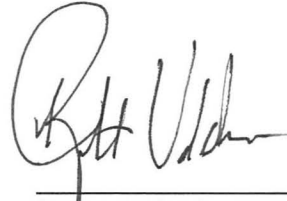
AYES: Bonelli, Castellanos, Malcolm, Merrifield, Moore, and Valderrama

NAYS: None.

EXCUSED: None.

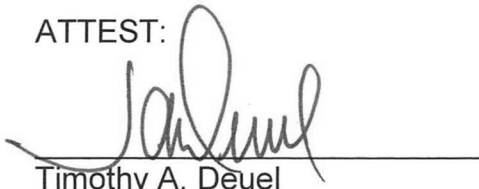
ABSENT: None.

ABSTAIN: None.



Robert Valderrama, Chair
Board of Port Commissioners

ATTEST:



Timothy A. Deuel
District Clerk

(Seal)

In May 2017, the San Diego Board of Port Commissioners enacted the Fireworks Display Ordinance, empowering the Port of San Diego to issue up to 47 firework permits, with a total weight cap of 9,056 pounds for fireworks in the City of San Diego. The accompanying table details how five organizations are allocated specific numbers of fireworks shows and corresponding weight allowances each calendar year, contingent upon compliance with the environmental mitigation measures stipulated in the ordinance. While these entities have not utilized their full quota of fireworks, the right to request these displays is firmly established. Firework shows are not just about entertainment; they enhance public recreation, attract visitors, and contribute significantly to local revenue and business goals. Supporting these displays enriches community experiences and fosters economic growth.

Reducing the maximum amount of pounds that are allowed for fireworks to 7,706 pounds annually (e.g., 15% Reduction), will require the District to engage in complex negotiations with these five organizations, who view their current allotment as a right that is reflected in the ordinance. Furthermore, the Port's fireworks permits have been treated as ministerial, meaning that permits have been issued to authorized entities provided they have not exceeded their annual limit and can comply with the requirements outlined in the ordinance. Therefore, over the course of the next several weeks, the Port will need to negotiate with these organizations and ask them to voluntarily forego a certain amount of fireworks to reach the 15% reduction. These negotiations will likely involve concessions on the part of the Port, and may range from improving service level commitments (e.g., increased vending enforcement at the Rady Shell) to monetary compensation.

	Pounds Allowed in SD Annually	2024	2023	2022	2021
Big Bay Boom	5,342	4,350.00	4,350.00	4,350.00	4,350.00
Lady of Rosary	18	51.00	61.00	61.00	27.00
NASSCO	439	0.00	0.00	0.00	0.00
SD Symphony	1,498	0.00	0.00	189.30	1,202.50
USS Midway	1,759	1,287.45	1,235.54	1,033.95	261.87
	9,056	5,688.45	5,646.54	5,634.25	5,841.37

	# of Shows Allowed in SD Annually	2024	2023	2022	2021
Big Bay Boom	1	1	1	1	1
Lady of Rosary	1	1	1	1	1
NASSCO	2	0	0	0	0
SD Symphony	20	0	0	3	14
USS Midway	23	17	15	13	3
	47	19	17	18	19

EXHIBIT NO. 6
APPLICATION NO. 6-24-0806
Past Fireworks
 Displays Data California Coastal Commission

CALIFORNIA COASTAL COMMISSION

SAN DIEGO COAST DISTRICT OFFICE
7575 METROPOLITAN DRIVE, SUITE 103
SAN DIEGO, CA 92108
VOICE (619) 767-2370
WWW.COASTAL.CA.GOV

**MEMORANDUM**

FROM: Dr. Corey Clatterbuck, Ecologist

TO: Dr. Kate Hucklebridge, Executive Director
Diana Lilly, District Manager
Alexander Llerandi, Coastal Program Analyst

SUBJECT: Big Bay Boom Fireworks Wildlife Impact Analysis

DATE: January 23, 2025

Documents Reviewed

- Bateman, P.W., et al. 2023. Not just a flash in the pan: short and long term impacts of fireworks on the environment. <https://doi.org/10.1071/PC22040>.
- Erbe, C., et al. 2022. The effects of noise on animals. In: Erbe, C., Thomas, J.A. eds. Exploring animal behavior through sound: Volume 1. Springer, Cham. https://doi.org/10.1007/978-3-030-97540-1_13.
- Frost, N. 2013. California least tern breeding survey, 2012 season. California Department of Fish and Wildlife, Wildlife Branch, Nongame Wildlife Program Report, 2013-01. Sacramento, CA.
- Handa, L., San Diego Audubon Society, July 11 2024. Email subject: Due to the 16,000+ nesting seabirds in Mission Bay, the San Diego Audubon Society Requests the California Coastal Commission to immediately revoke the Coastal Development Permit allowing SeaWorld fireworks.
- Hoekstra, B., et al. 2024. Fireworks disturbance across bird communities. <https://doi.org/10.1002/fee.2694>.
- de Leija, A.C., et al. 2023. A meta-analysis of disturbance caused by drones on nesting birds. <https://doi.org/10.5751/JFO-00259-940203>.
- Patton, R., discrete behavioral monitoring of California least terns at San Diego International Airport. Emails sent following July 4th events on 2016, 2017, 2018, 2021, 2022, 2023, and 2024.
- Shamoun-Baranes, J., et al. 2011. Birds flee en masse from New Year's Eve fireworks. <https://doi.org/10.1093/beheco/arr102>.
- Stickroth, H. 2019. Effects of Fireworks on Birds – A Critical Overview. <https://www.researchgate.net/publication/337033058>.
- U.S. Fish and Wildlife Service. 1985. Recovery plan for the California Least Tern, *Sterna antillarum brownii*. U.S. Fish and Wildlife Service, Portland, Oregon.

EXHIBIT NO. 7

APPLICATION NO.

6-24-0806

Biological Memo



Wayman, J.P., et al. 2023. L-band radar quantifies major disturbance of birds by fireworks in an urban area. <https://doi.org/10.1038/s41598-023-39223-1>.

In 2024 the Commission expressed interest in understanding the potential and realized impacts of firework events across the Coastal Zone. Fireworks are an unpredictable source of noise and light that may elicit a range of behavioral responses in wildlife with potential impacts on species survival and reproduction. I have been asked to evaluate whether Big Bay Boom, a fireworks event that occurs annually on July 4th in San Diego, impacts wildlife near the event.

Relevant Coastal Act Policies

Section 30230: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30240: (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

Project Description & Proximity to Natural Resources

Big Bay Boom is a fireworks display in San Diego Bay that occurs annually on July 4th. Similar to past years when the project has been exempt from permitting requirements, the display will launch from four separate barges stationed approximately equidistant from each other in North San Diego Bay (Figure 1) and last for approximately 20 minutes. July 4th is in the middle of the breeding season (generally March-September) for the majority of bird species, including coastal and marine species.

San Diego Bay is adjacent to urban and developed areas in the City of San Diego. The California least tern (*Sternula antillarum browni*, "least tern"), a federal- and statelisted endangered species, persists amidst this urbanization at two known locations: Lindbergh Field at the San Diego Airport and Naval Base Coronado - Naval Air Station North Island (Figure 1). These least tern colonies have existed at least since the development of the species Recovery Plan in 1985 and lie approximately 1-3 miles from the most proximal and distant launch barges. In past years the US Fish and Wildlife

Service (USFWS) has worked with the US Coast Guard and event planners to ensure a minimum one-mile buffer between the launch sites and any least tern nesting areas.¹ Other least tern colonies at Naval Amphibious Base Coronado, D Street Fill, and Mission Bay are within approximately 2-7 miles of the launch barges. While other bird species may use urban and developed areas of San Diego Bay for nesting, the California least tern has historical colonies in these locations and benefits from the heavy investment in monitoring data collected by volunteers, contractors, and state and federal biologists over the last 25 years.

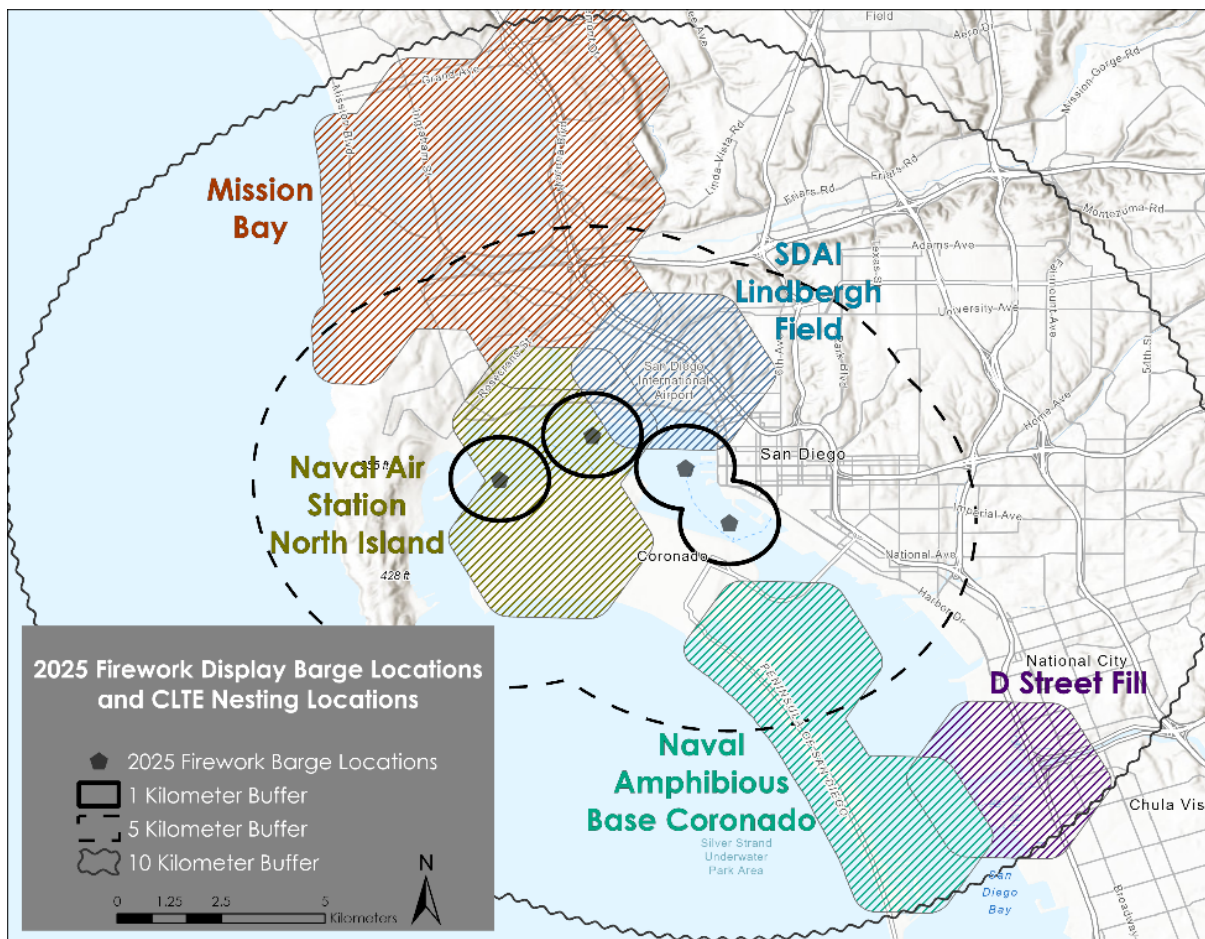


Figure 1: Map of Big Bay Boom launch barges in relationship to nearby California least tern (CLTE) nesting colonies. Colony locations are generalized as large polygons provided from CDFW's public-facing BIOS website. Figure provided by Laura VanVranken, CDFW

Potential Impacts to Wildlife

I investigated potential impacts to least terns by reviewing available least tern monitoring data and reports. The discrete monitoring data included seven occurrences during which a biologist was on site observing least tern behavioral responses during fireworks shows on July 4th at Lindbergh Field from 2016-2024 in addition to the

¹ Sandy Vissman, USFWS biologist, pers. comm.

statewide least tern report from 2012.^{2,3} Discrete behavioral monitoring describes the immediate behavioral responses of least terns to fireworks shows, such as leaving their nests or chicks, that may result in nesting abandonment, loss, or predation. The California Department of Fish and Wildlife (CDFW) provided annual productivity data over the last 30 nesting seasons for least terns nesting at Lindbergh Field and Naval Air Station - North Island, the least tern colonies most proximal to the proposed show. These data presumably would demonstrate whether breeding metrics were significantly different in 2020, when Big Bay Boom was cancelled due to the COVID-19 pandemic. I also consulted with biologists at the USFWS and CDFW regarding their understanding and data interpretation of fireworks show impacts on least terns.

Lastly, to understand potential observed impacts to other species in the area, I contacted International Bird Rescue and Project Wildlife, two groups that rescue injured coastal birds and wildlife, respectively. Neither group could provide data related to the impact of fireworks on wildlife. However, their perspectives on the impacts of fireworks to avian species are included where noted in this memorandum.

Discrete behavioral reports

The discrete behavioral reports discuss observed least tern behavior at the colony prior to, during, and after the July 4th fireworks displays. Before the Big Bay Boom fireworks show, least terns still brooding on the nest appeared to shift due to noise from other fireworks from farther distances, but other behaviors appeared to be normal for a typical night of monitoring (e.g., sitting and sleeping individuals, adults landing to feed chicks and fledglings). During the Big Bay Boom fireworks, least terns exhibited multiple reactive behaviors from standing and running about the colony, vocalizing alarm calls, making short flights along the colony grounds from fledglings, with higher flights from adults including flushing away from the colony, and chicks attempting to hide under panicked adults that remained on the ground. Least terns appeared to return to the colony within 30 minutes after the end of the show, and normal behaviors returned (e.g., adults brooding chicks). The monitoring reports also describe reactions to other disturbances that occurred before and after the shows, especially the presence of various predators including peregrine falcons, kestrels, crows, and gulls, but notably these disturbances did not occur during the shows.

While the behavioral reports did not have direct evidence of nest abandonment or loss due to this event, the single exception is the malfunctioning of Big Bay Boom on July 4th, 2012 that resulted in a single large explosion of all fireworks at one time. The report from that season estimated 7-20 abandoned nests following the event malfunction.³ This abandonment event more closely resembles the impacts of fireworks available in the scientific literature, where birds within five kilometers of fireworks take flight and may

² Patton, R., discrete behavioral monitoring of California least terns at San Diego International Airport. Emails sent following July 4th events in 2016, 2017, 2018, 2021, 2022, 2023, and 2024.

³ Frost, N. 2013. California least tern breeding survey, 2012 season. California Department of Fish and Wildlife, Wildlife Branch, Nongame Wildlife Program Report, 2013-01, Sacramento, CA.

not return to their original roost until days later.^{4,5} More serious firework impacts include disorientation, collisions with other birds, and death.^{6,7}

There are a number of potential explanations why a typical Big Bay Boom event does not elicit these reactions at the Lindbergh Field colony. First, by July 4th least terns are several weeks into their breeding season, whereas most of the scientific literature examines firework-related impacts during the non-breeding season (e.g., New Year's Eve fireworks events in the Northern hemisphere). Breeding birds, especially those with chicks and fledglings, are less likely to abandon the nest unless there is high incentive to do so. Non-breeding birds do not have a nest to attend to and therefore have fewer costs associated with departing a roosting area due to disturbance. The colony location inside an already noisy development may make the least terns nesting there more habituated to noise-related impacts. As previously discussed, there is a one mile buffer between the firework launch barges and the Lindbergh Field site, which may attenuate some noise impacts. Further, this particular colony has had fewer than 40 least tern nests per year in each of the last 10 years. A large colony hosting hundreds to thousands of seabirds, such as the mixed seabird colony at nearby West Ski Island in Mission Bay in 2024, is more likely to have panicked birds collide with each other and cause nest abandonment and loss during an acute disturbance.⁸ Finally, observations during the event by definition must occur at night. Highly experienced personnel confirm it is difficult to know and confirm the actions, reactions, and fate of every adult, fledgling, chick, and egg by observing at an appropriate distance from the colony at night, even with the help of night vision technology. Further, it is difficult to assign nest abandonment or failure to a discrete cause unless the monitor is there to observe it. This suggests that additional in-person monitoring during firework events is unlikely to yield different results.

As the discrete behavioral data does not indicate loss of least terns due to fireworks, it is unlikely, but possible, that this disturbance may have detectable indirect effects on least tern productivity. For example, the 2023 monitoring report notes a lack of consistent feeding of two chicks in the days prior to the event and the subsequent loss of both chicks on July 7th and 16th. The monitor notes, "Although fireworks were not the direct cause of death, the stress and exertion resulting from reacting to the fireworks likely contributed to the deteriorating health of these undernourished individuals." If the indirect impacts of fireworks are detectable in the available productivity data, we might

⁴ Hoekstra, B., et al. 2024. Fireworks disturbance across bird communities. <https://doi.org/10.1002/fee.2694>.

⁵ Wayman, J.P., et al. 2023. L-band radar quantifies major disturbance of birds by fireworks in an urban area. <https://doi.org/10.1038/s41598-023-39223-1>.

⁶ Bateman, P.W., et al. 2023. Not just a flash in the pan: short and long term impacts of fireworks on the environment. <https://doi.org/10.1071/PC22040>.

⁷ Stickroth, H. 2019. Effects of Fireworks on Birds – A Critical Overview. <https://www.researchgate.net/publication/337033058>.

⁸ Handa, L., San Diego Audubon Society, July 11 2024. Email subject: Due to the 16,000+ nesting seabirds in Mission Bay, the San Diego Audubon Society Requests the California Coastal Commission to immediately revoke the Coastal Development Permit allowing SeaWorld fireworks.

expect more least tern fledglings or more fledglings per breeding pair in 2020, a year when Big Bay Boom did not occur.

Least tern productivity analysis

The least tern nesting data at both Lindbergh Field and the North Island colonies do not indicate a substantial change in the number of fledglings or the breeding pair ratio in 2020 compared to the surrounding years (Figure 2 & 3). Both Lindbergh Field and North Island breeding pair numbers have declined over several years, a trend that is true for the majority of least tern colonies statewide. While the breeding pair ratio at Lindbergh Field increased in the last decade, this is likely attributable to increasingly smaller, but successful, numbers of breeding pairs at the site. Note that the number of fledglings and breeding pairs at Lindbergh Field has also decreased over time. Statewide, California least terns are producing approximately one fledgling per five nesting pairs or a breeding pair ratio of 0.2. The species' federal delisting criteria requires a 5-year mean of 1.0 breeding pair ratio at a minimum of 20 colonies, each with a minimum of 20 breeding pairs.⁹

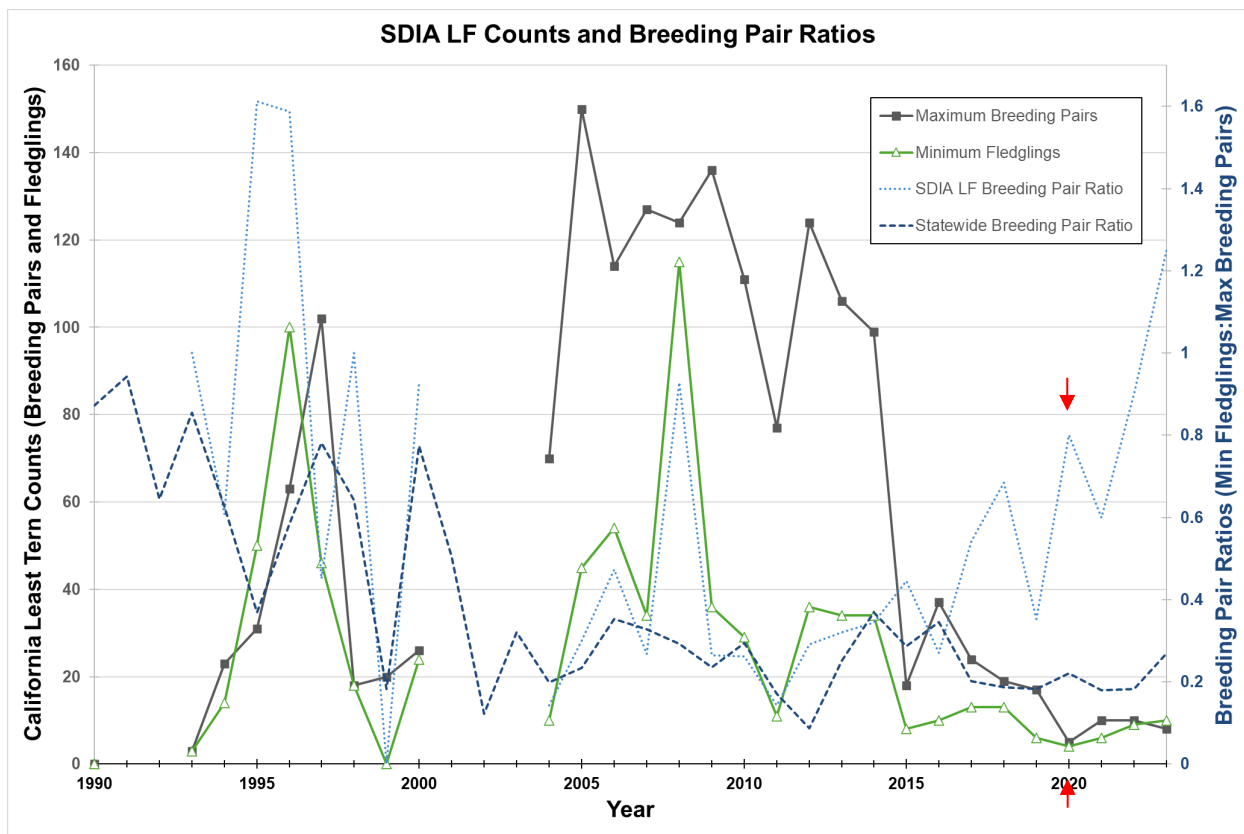


Figure 2: Productivity data for California least terns nesting at Lindbergh Field. The y-axis for maximum breeding pairs (dark squares) and minimum fledglings (green triangles) is on the left. The y-axis for the Lindbergh field breeding pair ratio (fine blue dash) and statewide breeding pair ratio (bold blue dash) is on

⁹ U.S. Fish and Wildlife Service. 1985. Recovery plan for the California Least Tern, *Sterna antillarum brownii*. U.S. Fish and Wildlife Service, Portland, Oregon.

the right. Red arrows highlight 2020, when Big Bay Boom was cancelled. Figure provided by Laura VanVranken, CDFW

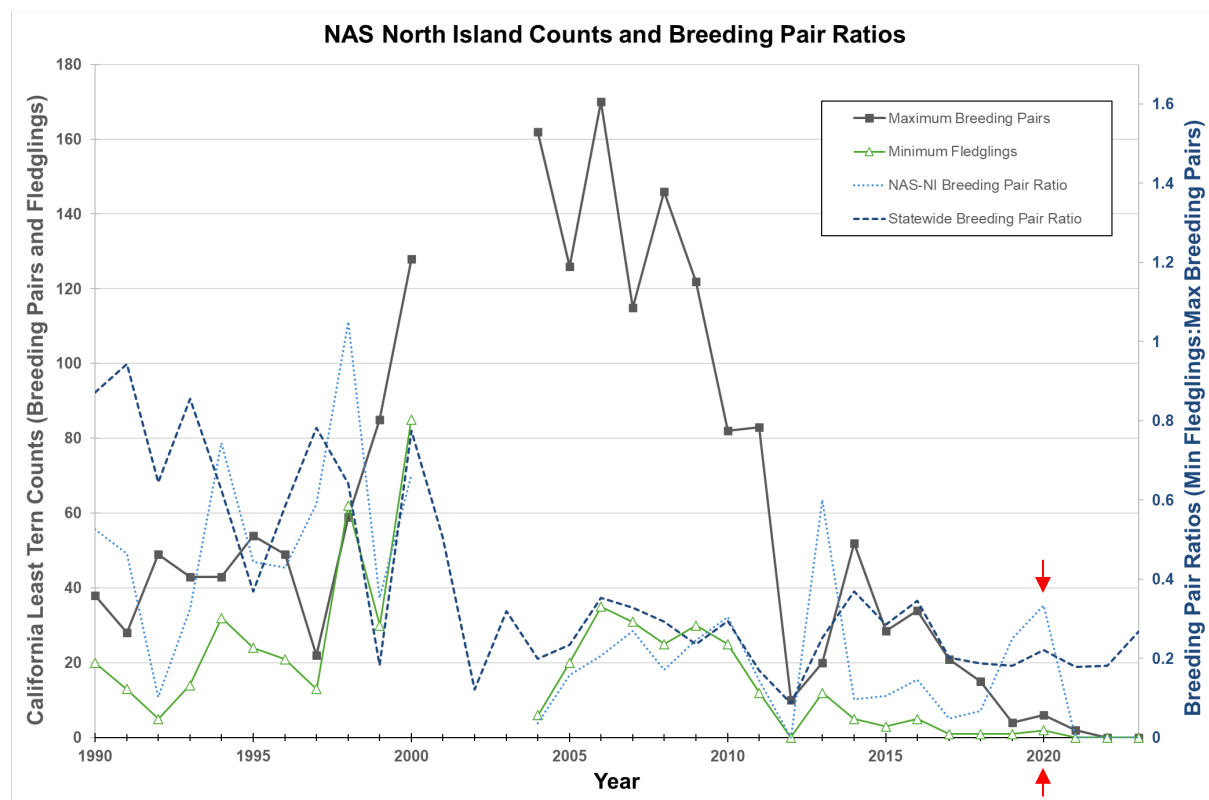


Figure 3: Productivity data for California least terns nesting at Naval Air Station – North Island (NAS-NI). The y-axis for maximum breeding pairs (dark squares) and minimum fledglings (green triangles) is on the left. The y-axis for the NAS-NI breeding pair ratio (fine blue dash) and statewide breeding pair ratio (bold blue dash) is on the right. Red arrows highlight 2020, when Big Bay Boom was cancelled. Figure provided by Laura VanVranken, CDFW

The available productivity data on California least terns, while long-term, detailed, and the best available science, is not designed to pinpoint the impacts of any specific disturbance at a nesting colony. If a single fireworks show is having a long-term impact on survival or reproduction of least terns nesting at Lindbergh Field or North Island, it is not detectable with the available data. However, the lack of detection does not suggest that fireworks do not impact least terns or nearby birds more generally. Detecting the signal of one night of fireworks in productivity data that integrates all potential impacts to the colony, including food availability, predation, urbanization and habitat loss, and climate change, was unlikely to begin with unless that signal was sufficiently strong. Fireworks shows that occur under other circumstances, e.g., more frequently and closer to larger or more sensitive seabird colonies, may have a more detectable impact. Therefore, even if a less environmentally damaging alternative to fireworks during Big Bay Boom is employed, it is not clear whether least terns will reap any detectable ecological benefits beyond a lack of panic and flushing described in the behavioral reports. However, as California least terns continue to decline in nesting population size

statewide, wildlife managers find it increasingly important to employ all available management strategies to protect the persistence of this species.

Summary

Fireworks from Big Bay Boom disturb least terns nesting at Lindbergh Field during and for approximately 30 minutes following a typical show, but nest abandonment or tern loss cannot be demonstrably linked to this event as planned. Additional in-person monitoring will likely not contribute meaningful data to better understand the potential impacts of Big Bay Boom on nearby least tern colonies. One area that remains in question is the level of noise that least terns at this colony are exposed to when Big Bay Boom occurs. Wildlife experts at USFWS and International Bird Rescue think that least terns primarily respond to the noise and vibrations associated with firework displays. Recording noise levels at least tern colonies during Big Bay Boom may help better understand hearing impacts to individual terns and how that may temporarily impact breeding and foraging behavior. While the data required to fully understand how a temporary sound disturbance scales up to impact a wildlife population is not available for any species and would take years to collect and assess,¹⁰ focused noise monitoring can better parameterize noise produced by the current show in context with ambient noise levels, and help provide future recommendations for firework displays with reduced impacts.

¹⁰ Erbe, C., et al. 2022. The effects of noise on animals. In: Erbe, C., Thomas, J.A. eds. Exploring animal behavior through sound: Volume 1. Springer, Cham. https://doi.org/10.1007/978-3-030-97540-1_13.