March 3, 2011

Michelle Mata
9174 Skypark Court, Ste. 100
San Diego CA 92123
mmata@waterboards.ca.gov

RE: PROPOSED GENERAL WASTE DISCHARGE REQUIREMENTS FOR THE PUBLIC DISPLAY OF FIREWORKS – TENTATIVE ORDER NO. R9-2011-0022, NPDES NO. CAG999002

Dear Ms. Mata:

Thank you for the opportunity to comment on the revised Waste Discharge Requirements for the Public Display of Fireworks. The City of Laguna Niguel, as the sponsor of a single annual fireworks display event adjacent to an inland receiving water, considers the proposed Tentative Order R9-2011-0022 to be a much more appropriate regulation than its draft predecessor. We appreciate the Staff's responsiveness to the concerns of all municipalities in a Category 2 situation.

We would like to 1) request a clarification, and 2) make a suggestion in the interest of simplification of paperwork. As background: Section V.C of the proposed Tentative Order requires that each Discharger complete a written Public Fireworks Display Log within 5 days following an event, and make the Log available to the RWQCB on request. Section II of Attachment E requires each Discharger to establish monitoring locations to demonstrate adequate BMP implementation. Section III.B.1 and Table 2 within Section X.B.3 of Attachment E require that a Discharger conducting no more than 10 events in a quarter submit a Public Display of Fireworks Post Event Report Form to the RWQCB within 10 days following an event. Section X.B.2 of Attachment E requires Dischargers to submit a Self-Monitoring Report and upload monitoring information into CEDEN and potentially also into CIWQS.

First: can you please clarify whether or not there is an intent to require Category 2 dischargers to upload "monitoring of BMP implementation" to CEDEN and CIWQS; or whether (as seems more appropriate and likely) this data uploading requirement was intended to apply only to the sediment and water quality data to be collected by Category 1 dischargers? Assuming there is no other aspect of a "Self Monitoring Report" beyond the submittal of the Post Fireworks Display Report Form that is intended to apply to Category 2 dischargers, we suggest that a separate Table 4 should be included within Section X.B.3 for "Additional Submittal Requirements for Category 1 Dischargers", identifying the annual submittal requirement for the 'Sediment and Water Quality Self-Monitoring Reports." Also, for clarity, paragraph X.B.1 should be relocated and appended to paragraph X.B.2, and the entire Section X.B should be re-titled, as follows:

B. ~~Self~~ Monitoring Report Submittals ~~(SMRs)~~

1. All Dischargers shall report ~~in the SMR~~ the results for ~~all~~ applicable monitoring specified in this MRP under sections III through IX, in accordance with the submittal schedules in Tables 2, 3 and 4 below.

2. Category 1 dischargers shall submit annual Self-Monitoring Reports (SMRs) including but not limited to the results of all required monitoring using USEPA-approved test methods or other test methods specified in this order. Dischargers must, following completion of annual SMRs, upload monitoring data and results into the California Environmental Data Exchange Network (CEDEN). If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR. At any time during the term of this permit the State or San Diego Water Board may notify the Discharger to electronically submit SMRs using the State Water Board's CIWQS program web site. Until such notification is given, the Discharger shall submit hardcopy SMRs. The CIWQS web site will provide additional directions for SR submittal in the event there will be service interruption for electronic submittal.

Second: We note that the informational details required to be recorded within 5 days for the Public Fireworks Display Log and to be made available to the RWQCB only on request, appears to be essentially duplicative of, and slightly expand upon, the information required to be submitted in the Post Fireworks Display Report within 10 days of an event. We would like to suggest that the few remaining informational details required for the Log be incorporated into the Display Report Form, so that only one set of documentation is required for each event. Appropriate edits would also need to be made to combine paragraphs A and B of Section III, Attachment E. The additional information on the Form, as shown on the attached redline, would include:

1) Certification that the FBMPP was fully implemented; and
2) Any pertinent visual monitoring observations during inspection.

We appreciate your consideration of these recommendations. Please do not hesitate to contact me at 949-362-4384 or npalmer@ci.laguna-niguel.ca.us if you have a question regarding our comments.

Sincerely,

Nancy R. Palmer
Environmental Programs Manager

Enclosed: Redline of Post Fireworks Display Report Form

Fireworks & Stage FX America

PO Box 488, Lakeside, CA 92040
1-800-464-7976
Phone: 619-938-8277 **Fax: 619-938-8273**
www.fireworksamerica.com
Email: Joe4pyro@cox.net

"The Difference is Quality"

March 6, 2011

San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123-4340

Re: Comment Letter-03/11/2011 Board Workshop-Fireworks Draft Permit

Mr. Gibson and Members of the Board:

I once again find the need to comment on Tentative Order (TO) R9-2011-0022, this time, specifically version 2/8/2011.

I strongly disagree with the Water Board's judgment on the need for such a permit. The numerous hours I have spent reading the revised TO still brings me to the same conclusion: The Board has provided no quantitative data supporting its contention that display fireworks constitutes a significant source of environmental water pollution, and thus a mandate for an NPDES permit. To the contrary, the scientific evidence gleaned through water monitoring nationwide shows that Display Fireworks do not cause ecological harm to our surface waters.

The TO includes the statement that display fireworks "pose no significant threat to Water Quality." Yet, the Board continues to push forward the implementation of a permitting process. Common sense begs the question: WHY??? Nowhere in the United States of America is this action being contemplated except in San Diego, CA. Does this make you trend setters? I doubt it. The actions just leave me wondering what is the real motive? It certainly can't be clean water; we already have that here in San Diego, just read your own reports. Why are you pressing forward with this general permit for display fireworks when you have other major water issues on which you should be spending your time and limited resources?

The revised TO ostensibly provides relief to many sponsors of fireworks displays, yet still encumbers some which sponsor multiple small displays, such as the San Diego Symphony Summer Pops Series and the USS Midway Museum. The TO applies to "point source discharges" of display fireworks fallout to the waters of Mission Bay and the San Diego Bay. After years of fireworks displays being conducted in and/or proximate to Mission Bay, it is judged clean, so say the reports we read and hear in the local news. Likewise, San Diego Bay is judged reasonably clean, despite the substantial ship and boat traffic and numerous fireworks displays conducted. I conclude that any adverse ecological events in San Diego Bay have not had public fireworks displays as causative.

As specific areas of concern, I offer the following.

1. I strongly object to the TO referring, sans any confirming data, to the discharges, associated with the public display of fireworks, to surface waters as either residual pollutant waste or worse, hazardous waste. Hazardous waste has very serious connotations, and fireworks decomposition products do not fall under the terms nor definitions of hazardous waste. That wording must be changed immediately and removed from all publications; we are not dealing with hazardous waste.

2. The TO fails to clearly define "Discharger," and who, the "person" is or shall be subject to the 1000 lb. NEW monitoring-free limitation and the permitting process. I have enclosed a copy of a March 3, 2011 letter to me from Dr. Roger Schneider which address the TO's shortcomings in this regard. Attendant this concern is the uncertainty in who is responsible for filing the Post Display Report with the Board?

3. I believe the 60 day advance notice to the Water Board for the permit is totally unreasonable. For the issuance of display permits, both the State of California and the City of San Diego require 10 days. The Water Board should be able to process their permit (if needed) within the same time frame as the State and City.

4. The TO lists in multiple locations the "typical fireworks constituents" as including but not limited to aluminum, antimony (misspelled as antinomy throughout the TO), barium, carbon, calcium, chlorine, cesium, copper, iron, potassium, lithium, magnesium, oxidizers including nitrates, chlorates, perchlorates, phosphorus, sodium, sulfur (appears incorrectly as sodium sulfur in the TO), strontium, titanium, and zinc. Although his presentation at the workshop on December 16, 2010 was cut short, Dr. Schneider did address many of these listed elements and anions and was able to demonstrate that most are naturally found in sea water. He told the workshop attendees that display fireworks do not contain elemental phosphorus, nor cesium or lithium, and yet we see the list unchanged. Dr. Schneider did not have the opportunity to address barium, which is present in some display fireworks compositions as either the nitrate, sulfate and/or carbonate, nor perchlorates. With respect to barium, any fireworks related discharges of this element to surface waters would either be or would soon be in the form of the sulfate. The solubility of barium sulfate in water is so low, that it is considered effectively insoluble and represents no threat to the environment. Perchlorates are mineralized in the San Diego surface waters through phytoremediation. I have attached a paper authored by Dr. Schneider which addresses this process. I have also attached a list of Standard Fireworks Chemicals, which is found in the American Pyrotechnics Association's standard 87-1.

5. I am troubled that the Board does not seem to care about the economic impact this Order can and will have on San Diego's business community. The cost to benefit of a Category 3 threat, the lowest threat to the environment, should be a deciding factor in whether or not implementation of a permitting process is warranted.

I commend the Board on the significant changes made in the original Tentative Order. However, the Board has not yet made enough changes to make this even reasonably workable, nor has the Board made the change that I feel makes the most sense: Eliminate the Tentative Order, it is not needed, nor does the Board have the authority to regulate the public displays of fireworks.

Do not think for one minute that you and the other members of the Board are the only ones who care about our water quality. All of us in the fireworks industry have been working hard for years to keep our waters and our land clean and protected. But when common sense gives way to regulatory abuse, the fight must be fought. My world is beset with obtaining permits and following many rules and regulations. It is inextricable with the service that we provide to our sponsors. But, when new potential regulations spring up that have no logical nor scientific basis, just the reasoning that "an ounce of prevention is worth a pound of cure", they engender another strong response to drive the deliberations towards prudency.

Sincerely,

Joseph R Bartolotta

Joseph R. Bartolotta
President

*** 4.3.2** Devices containing any chemical not specified in Table 4.3-1. For each item for which approval is sought, the manufacturer shall submit a sample of each pyrotechnic mixture containing any chemical not specified in Table 4.3-1 to a person approved by DOT to examine explosives or the applicant may obtain a test report from a recognized Competent Authority (for fireworks manufactured abroad). The manufacturer shall then submit a Fireworks Approval Application (see Appendix D), together with the appropriate laboratory reports to DOT. DOT may then issue approval based on the information contained in the application and accompanying laboratory report(s).

TABLE 4.3-1
*** Standard Fireworks Chemicals**

Chemical	Typical Use
Aluminum	Fuel
Ammonium Perchlorate	Oxygen Donor
Antimony	Fuel
Antimony Sulfide	Fuel
Barium Carbonate	Neutralizer
Barium Nitrate	Oxygen Donor
Barium Sulfate	Oxygen Donor
Bismuth Oxide	Oxygen donor
Boric Acid	Neutralizer
Calcium Carbonate	Neutralizer
Calcium Sulfate	Oxygen Donor
Carbon or Charcoal	Fuel
Copper Metal	Color Agent
Copper Oxide	Oxygen Donor, Color Agent
Copper Salts (except Copper Chlorate)	Color Agent
Dextrine	Fuel/Binder
Hexamethylenenetetramine (Hexamine)	Fuel
Iron and Iron Alloys (e.g., ferro/titanium)	Fuel
Iron Oxide	Oxygen Donor
Magnalium (Magnesium/Aluminum)	Fuel
Magnesium (in display fireworks and theatrical pyrotechnics only)	Fuel
Magnesium Carbonate	Neutralizer
Magnesium Sulfate	Oxygen Donor
Nitrocellulose - see Miscellaneous Compounds	
Nitrocellulose based lacquers	Binder
Phosphorus, Red (only as provided in Table 3.7.1)	Fuel

Chemical (continued)	Typical Use
Potassium or Sodium Benzoate	Whistle
Potassium Bichromate (Potassium Dichromate) (not to exceed 5% of formulation)	Oxygen Donor
Potassium Chlorate (only as provided in Table 3.7.1)	Oxygen Donor
Potassium Hydrogen Phthalate	Whistle
Potassium Nitrate	Oxygen Donor
Potassium Perchlorate	Oxygen Donor
Potassium Sulfate	Oxygen Donor
Silicon	Fuel
Sodium Bicarbonate (Sodium Hydrogen Carbonate)	Neutralizer
Sodium Nitrate	Oxygen Donor
Sodium Salicylate	Whistle
Sodium Salts (except Sodium Chlorate)	Color Agent
Sodium Sulphate	Oxygen Donor
Strontium Carbonate	Color Agent
Strontium Nitrate	Oxygen Donor
Strontium Salts (except Strontium Chlorate)	Color Agent
Strontium Sulfate	Oxygen Donor
Sulfur	Fuel
Titanium (particle size must not pass through 100 mesh sieve if 1.4G or 1.4S Fireworks)	Fuel

Miscellaneous Compounds:

Organic compounds (compounds such as lactose, shellac, red gum, chlorinated paraffin and polyvinyl chloride, consisting of some combination of carbon with hydrogen, oxygen and/or chlorine; nitrogen may be present if it accounts for less than 10% (by weight) of the compound.)

Nitrocellulose with not more than 12.6% nitrogen by mass, that meets the criteria for classification as a 4.1 Flammable Solid, is permitted as a propelling or expelling charge provided there is less than 15 grams of nitrocellulose per article.

NOTE: Exact chemical identity of each "Organic compound" must be included when submitting an Approval Application (See Appendix D) to DOT.

*** 4.4 Approval for Combination Devices for Display Purposes.** When two or more articles of consumer fireworks, display fireworks, or theatrical pyrotechnics that have

3.6.2.8 Aerial Devices. Each device intended to produce a visible or audible effect high in the air must be designed to produce the effect at or near the apex of its flight.

*** 3.6.2.9 Smoke Devices.** Each smoke device must be so constructed that it will neither burst nor produce excessive flame (excluding fuse and small but brief bursts of flame accompanying normal smoke production). Smoke devices may not contain plastic in direct contact with the pyrotechnic composition, nor may smoke devices resemble, in color and configuration, banned fireworks devices, such as M-80 Salutes, Cherry Bombs, or Silver Salutes.

* 3.7 Prohibited Chemicals and Components

*** 3.7.1 Prohibited Chemicals.** Consumer fireworks devices offered or intended for sale to the public may not contain a chemical enumerated in Table 3.7-1, except for small amounts (<0.25% by weight) as impurities, and except as specified therein.

NOTE: Display fireworks and theatrical pyrotechnics (Section 2.15) are not subject to the provisions of this section.

* TABLE 3.7-1
Prohibited Chemicals for Consumer Fireworks

(a) Arsenic Sulfide, Arsenates, or Arsenites
(b) Boron
(c) Chlorates, except:
  (1) In colored smoke mixtures in which an equal or greater weight of sodium bicarbonate is included.
  (2) In party poppers
  (3) In those small items (such as ground spinners) wherein the total powder content does not exceed 4 grams of which not greater than 15 percent (or 600 milligrams) is potassium, sodium, or barium chlorate.
  (4) In firecrackers
  (5) In Toy Caps
(d) Gallates or Gallic Acid
(e) Magnesium (magnesium/aluminum alloys, called magnalium, are permitted).
(f) Mercury salts
(g) Phosphorus (red or white) except that red phosphorus is permissible in caps and party poppers.
(h) Picrates or Picric Acid
(i) Thiocyanates
(j) Titanium, except in particle size that does not pass through a 100-mesh sieve.
(k) Zirconium
(l) Lead tetroxide (red lead oxide) **and other lead compounds**

* 3.7.2 **Prohibited Components.** No component of any consumer fireworks device or novelty, may upon functioning, project or disperse any metal, glass, or brittle plastic fragments.

* 3.7.3 **Forbidden Devices.** Any device intended for sale to the public that produces an audible effect (other than a whistle) by a charge of more than 130 milligrams (2 grains) of explosive composition per report. Devices obtained for bona-fide pest control purposes in accordance with regulations promulgated by CPSC in Title 16, Code of Federal Regulations are not forbidden if approved in accordance with Part 173.56 of Title 49 CFR.

For transportation purposes, the term forbidden devices also includes mixtures or devices containing a chlorate and an ammonium salt or an acidic metal salt, devices that contain yellow or white phosphorus, devices that combine an explosive and a detonator or blasting cap, and any device that has not been approved by the DOT.

* 3.8 Specific Requirements for Theatrical Pyrotechnics

* 3.8.1 Theatrical pyrotechnics that are approved as UN0431, Articles, Pyrotechnic, 1.4G shall not bear a warning label that resembles the required wording on a consumer fireworks device. A warning label providing instructions to a trained operator is permitted, but alternative wording must be used.

* 3.8.2 Theatrical pyrotechnics may or may not have an ignition device attached.

* 3.8.3 All requests for approval of a device as Articles, Pyrotechnic shall be accompanied by a signed certification stating that the article is intended for professional use in the entertainment industry and will not be offered for sale to the general public.

* 3.8.4 Approvals for classification as Articles, Pyrotechnic shall be evaluated based on the weight of pyrotechnic composition in the individual article, and compared to the allowable weights for the corresponding category of 1.4G consumer fireworks. If a 1.4G classification is desired for an article containing more pyrotechnic composition than is permitted for a comparable consumer firework, the DOT approval procedure in 49 CFR 173.56(b)(1) shall be followed.

* 3.9 **Approval.** All consumer fireworks (Fireworks UN0336), novelties and theatrical pyrotechnics offered for transportation in the United States shall be classified and approved for transportation purposes by the DOT, in accordance with the following procedure.

*3.9.1 **Fireworks and Novelties containing mixtures of chemicals specified in Table 4.3-1 but none of the chemicals prohibited by Sec. 3.7.** For each item for

PHYTOREMEDIATION OF PERCHLORATE FROM FIREWORKS

Roger L. Schneider
Rho Sigma Associates, Inc.

Dawit D. Yifru
Geosyntec Consultants
USA

11th INTERNATIONAL SYMPOSIUM ON FIREWORKS
11vo. SIMPOSIO INTERNACIONAL A FUEGOS ARTIFICIALES

April 20-24, 2009
Del 20 al 24 de abril de 2009

Puerto Vallarta, México

PHYTOREMEDIATION OF PERCHLORATE FROM FIREWORKS

Roger L. Schneider
Rho Sigma Associates, Inc.
Whitefish Bay, WI USA

and

Dawit D. Yifru
Geosyntec Consultants
Kennesaw, GA USA

ABSTRACT

Ammonium and potassium perchlorate are strong oxidants widely employed in the pyrotechnic compositions in fireworks. Although its reduction is thermodynamically highly favorable, the perchlorate anion's reactivity is kinetically inhibited, primarily attributable to steric hindrance of access to the central chlorine atom within the tetrahedral ClO_4^- structure. This relative inactivity has historically made perchlorate a spectator anion in aqueous solution chemistry and explains its classification as a persistent environmental contaminant. The perchlorate anion is a potent competitive inhibitor of iodide (I^-) transport by the sodium iodide symporter (NIS) expressed in the basolateral membranes of human thyroid follicular cells. This inhibition can result in the reduction of thyroid hormone production critical for the normal growth and development of fetuses, infants and young children. Perchlorate has no other adverse physiological effects and is normally excreted quantitatively. However, public concern over the suppression of thyroid function has engendered government regulation and the research, development and use of technologies for the detection, measurement and removal of perchlorate contamination in drinking water supplies. In 2005, the U.S. Environmental Protection Agency adopted a Reference Dose (RfD) for ClO_4^- of 0.7 μg/kg/day and recently established an Interim Drinking Water Health Advisory level of 15 μg/l. In the last ten years, researchers have investigated the transformation of perchlorate to chloride (Cl^-), called mineralization, in which plants and plant-microbe systems serve as the mediators. This plant-assisted degradation of perchlorate is an example of phytoremediation. Perchlorate can be decomposed in the plant's leaves (phytodegradation) and in the root environment or rhizosphere (rhizodegradation). Phytodegradation is a slow process and is normally accompanied by phytoaccumulation, in which perchlorate is stored inside plant tissues. This accumulated perchlorate will likely either return to the plant's local environment or enter the food chain. Rhizodegradation is a much faster process involving bacteria in anaerobic conditions in which perchlorate is sequentially converted to chlorate (ClO_3^-), chlorite (ClO_2^-) and chloride by reaction with many organic compounds (e.g., acetate). This rhizodegradation is hampered by the presence of nitrate, which is preferentially reduced by the bacteria in the root zone. Many species of terrestrial and aquatic plants are capable of remediating perchlorate, provided adequate levels of oxidizable (electron donating) organic compounds are available. A recently reported study of the contamination of

lake waters with perchlorate from fireworks display fallout has shown that perchlorate concentrations rise immediately following the display, then decrease to background levels within days. It is likely aquatic microbial fauna phytoremediation is playing a principal role in the perchlorate mineralization. Towards minimizing long term environmental contamination with fireworks associated perchlorate, fireworks displays should be conducted whenever possible at sites rich in terrestrial and/or aquatic vegetation.

INTRODUCTION

Potassium perchlorate (KP) and ammonium perchlorate (AP) are strong oxidants, which are now used extensively worldwide in pyrotechnic compositions and are certainly important compounds to the fireworks industry. While other perchlorates of pyrotechnic interest are known and available, their use is restricted to special, low volume usage. From the pyrotechnics standpoint, KP and AP have chemical and physical properties, which are nearly ideal. Pyrotechnic compositions containing these perchlorates produce the visual, acoustical, propulsive and explosive effects desired with relatively low ignition sensitivities and good storage and handling characteristics.

The perchlorate anion, ClO_4^-, has become the subject during the last twelve years of intense environmental interest, as it is considered a significant threat to drinking water supplies. The perchlorate anion is a potent competitive inhibitor of iodide (I^-) transport into human thyroid cells (thyrocytes). This inhibition can result in the reduction of thyroid hormone production critical for the normal growth and development of fetuses, infants and young children. Because of this inhibitory effect, low-dose exposure to ClO_4^- is expected to produce adverse health effects similar to those caused by dietary iodide deficiency. Perchlorate has no other adverse physiological effects and is normally excreted quantitatively. However, public concern over the suppression of thyroid function has engendered government regulation and the research, development, and use of technologies for the detection, measurement and removal of perchlorate contamination in drinking water supplies.

In the last decade, researchers have investigated the transformation of perchlorate to chloride (Cl^-), called mineralization, in which plants and plant-microbe systems serve as the mediators. This plant-assisted degradation of perchlorate is an example of phytoremediation. Phytoremediation may serve to mitigate any contamination of the environment with perchlorate, associated with the discharge of fireworks.

REGULATING PERCHLORATE

With authority under the Safe Drinking Water Act (SDWA), in March 1998, the U.S. Environmental Protection Agency's (USEPA) Office of Water formally added perchlorate to the drinking water contaminant candidate list (CCL)[1-3]. In December 2008, an Interim Drinking Water Health Advisory for Perchlorate [4] was promulgated establishing the advisory level of 15 μg/l (15 ppb) and an oral Reference Dose (RfD) of 0.7 μg/kg/day. The RfD corresponds to a "no

observable adverse effects level" (NOAEL), and is an exposure level considered to be without significant risk to humans, including sensitive or vulnerable subgroups (e.g., very young and very old), when perchlorate is ingested daily over protracted periods. This RfD for ClO_4^- is the equivalent of a 24.5 μg/l (24.5 ppb, 250 nM) maximal concentration limit in drinking water for a 70 kg individual consuming 2 liters of water per day as the only dietary source of perchlorate. Several states have adopted the 15 μg/l concentration as an action level. Three states have action levels well below the USEPA advisory level: Massachusetts (2 μg/l), Texas (4 μg/l), and California (6 μg/l)[4].

TOXICOLOGY

Upon ingestion, perchlorate is readily absorbed through the gastrointestinal tract. Absorption through the skin is minimal, and because perchlorates have extremely low vapor pressures at normal ambient temperatures, an inhalation hazard could only exist where perchlorates are present as suspended dusts. Perchlorate is excreted rapidly and quantitatively in the urine, and no evidence exist suggesting perchlorate is metabolized[5]. According to the USEPA, perchlorate is "not likely to pose a risk of thyroid cancer in humans, at least at doses below those necessary to alter hormone homeostasis," and " the epidemiological evidence is insufficient to determine whether or not there is a causal association between exposure to perchlorate and thyroid cancer."[4]

The thyroid gland uses iodide (I^-) from the bloodstream to biosynthesize the two metabolic hormones, L-tetraiodothyronine (T_4) and L-triiodothyronine (T_3). T_4 is also known as thyroxine. T_3 and T_4 regulate growth, cell differentiation, and the metabolisms of lipids, proteins, and carbohydrates[6]. Iodide is transported by the sodium iodide symporter (NIS), a glycoprotein expressed in the basolateral membranes of human thyroid follicular cells (thyrocytes)[7]. Each thyrocyte is serviced by many NISs. The transport process, called the cellular iodide pump, preferentially selects anions on the basis of ionic volume: iodide (I^-) $\approx$ thiocyanate (SCN^-) $<ClO_4^-$, pertechnetate (TcO_4^-)[2]. The NIS prefers to transport perchlorate over iodide[7]. Thus, the presence of ClO_4^- in the bloodstream inhibits the uptake of iodide by the thyroid and can stimulate excessive release of stored iodide from the gland. The inhibition can result in the reduction of thyroid hormone production critical for the normal growth and development, especially in the central nervous system, of fetuses, infants and young children.

Within the healthy adult population, perchlorate ingestion manifests a considerably lower risk of adverse effects. A study at an ammonium perchlorate plant in 1999 found that workers who daily inhaled NH_4ClO_4 dust suffered no thyroid effects and the bloodstream perchlorate was readily egested through urination[6]. Because ClO_4^- merely competes with I^- for transport through the NIS, maintaining adequate dietary levels of iodine will minimize the risk of adverse health effects associated with chronic perchlorate ingestion.

PECULIAR PERCHLORATE

The conversion of ClO_4^- to chlorate, ClO_3^-, is thermodynamically favored ($\Delta E<0$). Based upon this and other thermodynamic data, perchlorate salts should be very highly reactive substances. They should be unstable in the solid state, and in solution, the perchlorate anion should be a strong and readily reactive oxidant, able to oxidize water to oxygen[2]. In reality, most inorganic perchlorates are stable solids, and when in solution at low concentration (<10%w/w) or in weakly acidic to basic (pH>1) conditions, the perchlorate anion is with most reducing agents essentially unreactive[3].

Perchlorate's non-lability is well known and exploited in synthetic and analytical chemistry. This relative inactivity has historically made perchlorate a spectator anion in aqueous solution chemistry and explains its classification as a persistent environmental contaminant. The stability of the perchlorate anion is attributable to the strength of the chlorine-oxygen bonds and the requirement that reduction must initially proceed through the abstraction of an oxygen atom rather than through direct attack of the central chlorine atom. The tetrahedral structure of $ClO_4^-$and the delocalization of the negative charge over all four oxygens provide a steric control on reductive vulnerability. The reduction of the perchlorate anion is strongly kinetically controlled, with the abstraction of the first oxygen having a high activation energy.

QUANTITATIVE ANALYTICAL CHEMISTRY

Urbansky[2,3] has reviewed the several perchlorate determination methods, which were employed in analytical laboratories prior to the year 2000. In February 2000, USEPA announced[4,8] their selection of the standard analytical method, 314.0, for perchlorate which is based upon ion chromatography with conductivity detection. It was approved for the monitoring of perchlorate in the years 2001-2003. The method detection limit (MDL) is 0.53 μg/l (0.5 ppb). USEPA Methods 314.1, 314.2, 331.0, and 332.0 were published in 2005 through 2008 and reflected improvements in the MDL[4]. Method 331.0 employs liquid chromatography with electrospray ionization mass spectrometry (LC/ESI-MS). The MDL for perchlorate using this method is 0.008 μg/l (8 ppt, parts per trillion) with single stage mass spectrometry and 0.005 μg/l (5 ppt) with tandem mass spectrometry (LC/ESI-MS-MS)[4]. The MDLs of the state-of-the-art analytical methods is now at least three orders of magnitude below the action levels for perchlorate in drinking water supplies.

PERCHLORATE USES AND ENVIRONMENTAL OCCURRENCE

Environmental perchlorate can have both natural and anthropogenic (man-made) origins. Reports dating to the late 1800s document findings of perchlorates in natural deposits of Chilean saltpeter (sodium nitrate). Analyses of Chile saltpeter by USEPA and the Department of Energy have found concentrations of approximately 1 g ClO_4^-per kg $NaNO_3$ [3]. Chili saltpeter is used as a fertilizer, particularly favored by tobacco farmers. Questions as to how perchlorate is or was produced naturally remain the subject of speculation[9], but lightning and reactions with ozone are frequently cited. Perchlorate has been detected in rain and snow samples indicating an

atmospheric origin[10]. Very recently, NASA reported and confirmed that the Phoenix Mars Lander discovered perchlorate in Martian soil[11]. Perchlorate is not found in significant levels in seawater, and high levels of fresh water contamination can usually be attributed to one or more steps in the life cycle of perchlorate containing fertilizers, energetic materials (propellants, explosives and pyrotechnics), and other products. Perchlorates are used in nuclear reactors, electronic tubes, as additives in lubricating oils, in tanning and finishing of leather, as mordants for dyed fabrics, in electroplating and electropolishing, aluminum refining, rubber manufacture, and in the production of paints and enamels.

Commercial quantities of sodium perchlorate are usually prepared by electrolysis of aqueous solutions of sodium chloride, in which the chloride ion is successively oxidized through hypochlorite (ClO^-), chlorite (ClO_2^-), chlorate (ClO_3^-), and finally to perchlorate. Large commercial quantities of ammonium perchlorate are used in 1.3 solid rocket propellants and to a limited extent in pyrotechnic and explosive compositions. Potassium perchlorate is used extensively in pyrotechnic compositions and in black powder-substitute gun propellants. Both the ammonium and potassium perchlorates are prepared from the sodium salt by metathesis (double decomposition) reactions. The much higher aqueous solubility of sodium perchlorate allows the facile fractional crystallization of the ammonium and potassium salts.

The manufacture, transportation and disposal (recycling and/or demilitarization) of ammonium perchlorate based rocket propellants and potassium perchlorate based pyrotechnics can result in soil and ground water contamination. However, the normal burning of rocket propellants and pyrotechnic compositions containing a perchlorate as the oxidizer, results in the decomposition of the perchlorate anion, with little, if any, unreacted. The potassium perchlorate in black powder substitutes, such as Pyrodex, is also decomposed, with little unreacted, in the normal functioning of the propellants. The use by sportsmen of black powder substitutes in their muzzle-loading rifles, pistols and cannons would not be expected to be a significant source of perchlorate contamination in the environment. Many pyrotechnic compositions found in signal devices, such as highway flares, railroad fusees, and marine flares and meteors contain potassium perchlorate. Some marine smoke signal compositions also contain perchlorates. If these compositions burn normally, they too would not be expected to be significant sources of environmental perchlorate[12].

Railroad fusees, which contain potassium perchlorate at levels typically below 10% by weight are often burned incompletely. Users will intentionally extinguish the flame if the burn time of the fusee exceeds the time needed for signaling. The railroad workers will often drop and leave the unburned portion of the fusee on the ground near the rails. Although relatively small quantities of potassium perchlorate are involved, this source of perchlorate could be environmentally significant, depending upon the regulatory action levels for soil and water contamination. In years past, railroads used sodium chlorate, contaminated with perchlorate, as an ingredient in herbicides to suppress the growth of foliage along rail corridors. Soils around rail beds may be contaminated with perchlorate, but subject to phytoremediation.

Potential contamination attributable to fireworks

Many of the pyrotechnic compositions employed in display fireworks (US Department of Transportation hazard class 1.3G Fireworks, UN0335) and in consumer fireworks (USDoT 1.4G Fireworks, UN0336) contain potassium perchlorate and to a lessor extent ammonium perchlorate. Ammonium perchlorate's use in firework compositions is relatively new. It can be found in mixtures, which burn steady, producing bright, rich colored flames, or burn stroboscopically with bright white or colored flames.

The aerial display shells seen at public displays of fireworks are propelled ballistically from mortars, using black powder as the propellant. These shells (projectiles) "break" or "burst" (explode) in the sky, to produce the colorful burst patterns (visual effects) or bright flash / deafening booms so often seen and heard. The colorful burst patterns are created by burning "stars" ejected radially from the breaking shells. Stars are chunks of pyrotechnic compositions in the form of spheres, cubes, cylinders and irregular shapes. Many of these star compositions contain perchlorates as oxidizers. Sometimes stars within a breaking shell, fail to be ignited. Such stars, called "blind stars," or "blown black stars," fall back to the ground, and can be dispersed over a large area of the display site. Other components of aerial display shells, which contain potassium perchlorate, such as pyrotechnic whistles, can also fail to be ignited and be dispersed over the display site. Potassium perchlorate is commonly employed as the oxidizer in "salute compositions", also known as flash powders. Some manufacturers produce salute compositions containing ammonium perchlorate. These explosive mixtures are used in devices, called salutes, reports, shots or siatenes, which produce the bright white flash and deafening booms. When a salute functions, it is not uncommon for some unreacted perchlorate to be present in the flash powder decomposition products. With a reasonable assumption that most of the perchlorate present in the pyrotechnic compositions is ultimately decomposed in the burning of fireworks, it would only be necessary to consider perchlorate which survives the normal discharge of product, such as that in blind stars, unignited display shell inserts, and residues[12].

While research has been reported concerning the environmental effects of fireworks on bodies of water, it did not address perchlorate[11].

PHYTOREMEDIATION OF PERCHLORATE

In the last ten years, researchers have investigated the transformation of perchlorate to chloride (Cl^-), called mineralization, in which plants and plant-microbe systems serve as the mediators. This plant assisted degradation of perchlorate is an example of phytoremediation. Perchlorate can be decomposed in the plant's leaves (phytodegradation) and in the root environment or rhizosphere (rhizodegradation). Phytodegradation is a slow process and is normally accompanied by phytoaccumulation, in which perchlorate is stored inside plant tissues. This accumulated perchlorate will likely either return to the plant's local environment or enter the food chain. Rhizodegradation is a much faster process involving bacteria in anaerobic conditions in which perchlorate is sequentially converted to chlorate (ClO_3^-), chlorite (ClO_2^-) and chloride by reaction with many organic compounds (e.g., acetate, CH_3COO^-). Many species of terrestrial and aquatic plants are capable of remediating perchlorate, provided adequate levels of oxidizable (electron donating) organic compounds are available.

Phytodegradation of perchlorate in poplar tree leaves was demonstrated by Van Aken and Schnoor[14] in a study in which small cuttings grown in hydroponic conditions were incubated in the presence of ^{36}Cl radioisotopically labeled ClO_4^-at an initial concentration of 25 mg/l [25,000 μg/l (ppb)]. The isotopic label provided the means of unambiguously determining the amount and location within the plant tissues of unreacted ClO_4^-, and it's degradation products, ClO_3^-, ClO_2^-, and Cl^-. About a 50% reduction in the initial ClO_4^- concentration was realized after 30 days of incubation. Because the experiments were performed under sterile conditions, the results show that poplar tree tissues are able to mineralize ClO_4^-, and that the reduction proceeds through a sequential pathway similar to the microbial metabolism of ClO_4^- involving perchlorate reductases and chlorite dismutases. Unlike microbial perchlorate-reducing enzymes, the plant biocatalysts tolerate oxygen (aerobic conditions).

Yifru and Nzengung[15], investigated the uptake and phytoaccumulation of perchlorate by natural terrestrial and aquatic vegetation growing within perchlorate-contaminated sites in arid [Las Vegas Wash (LVW), Nevada] and subhumid [Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas] climates, during multiple seasons. All vegetation species collected from the two sites contained measurable levels of perchlorate. Plants sampled at LHAAP included willow, pine, sweet gum, oak, goldenrod, crabgrass, Bermuda grass, and bullrush. At the LVW site, samples of salt cedar, black willow, cattail, algae, and sedge were collected. In general, higher concentrations of phytoaccumulated perchlorate were observed in the leaf tissue of plants growing in the arid than in the subhumid climate. The high concentrations of phytoaccumulated perchlorate, observed at both sites, suggests that the inadequate levels of organic compounds, serving as electron donors, were available to the plants to promote or sustain rhizodegradation. The amount of perchlorate uptaken and accumulated by terrestrial and aquatic plants is influenced by the local perchlorate concentration, the plant species, and the season. Grasses and salt cedar trees phytoaccumulated significantly higher amounts of perchlorate than woody plants, and leaves harvested in late summer contained higher perchlorate concentrations than leaves harvested in spring and early summer. Senescent leaves and litter fall, containing phytoaccumulated perchlorate, evidences a potential for perchlorate recycling in an ecosystem. If a perchlorate-contaminated site is to be phytoremediated, it is important that senesced vegetation, including leaves and cuttings, be collected and composted and rhizodegradation be enhanced.

Rhizodegradation of perchlorate by willow trees was investigated by Yifru and Nzengung[10] in which hydroponically prerooted cuttings in bioreactors, under greenhouse conditions, were dosed with ClO_4^- and one of four organic carbon sources. The organic carbon sources were acetate (CH_3COO^-), ethanol (CH_3CH_2OH), 100% organic mushroom compost, and chicken litter extracts; the later two being agricultural waste derivatives. In the bioreactors dosed with dissolved organic carbon at 500 mg/l and an initial perchlorate concentration of 25 to 40 mg/l (25,000 to 40,000 ppb), rhizodegradation produced a reduction in the perchlorate to below the ion chromatography method detection limit of 2 μg/l in approximately 9 days. The results of these experiments clearly show that supplying electron donors derived from organic carbon sources to the root zone of plants biostimulates rapid rhizodegradtion of perchlorate. Similar results in rhizodegradation efficacy were achieved by Yifru and Nzengung[16] in which aqueous perchlorate was a co-contaminant with the potent carcinogen, N-Nitrosodimethylamine (NDMA).

Wilkin, et al[17], investigated the perchlorate contamination of the surface waters of Wintersmith Lake, near Ada, Oklahoma from the fallout of public displays of fireworks in July of 2004, 2005, 2006 and November 2005. Water samples taken from locations adjacent to the launch site, preceding the displays, had perchlorate concentrations in the range of 0.005 to 0.081 μg/l , with a mean of 0.043 μg/l. Measurements taken within 14 hours after the displays showed increases in the perchlorate concentrations ranging from 24 to 1028 times the mean baseline value. The wide range in concentrations immediately after the displays could be attributed to variations in the quantities of fireworks discharged, the amounts of unreacted potassium and ammonium perchlorates, and wind speed and direction. A maximum perchlorate concentration of 44.2 μg/l was measured following the July 4th 2006 display. Although the ClO_4^- concentration returned to the background value in about 24 days, it is important to note that the concentration decreased by nearly 80% within the first two days. The rate of attenuation correlated to surface water temperature and could be modeled as pseudo-first order. As lake sediments showed low adsorption capacity (< 100 nmol/g), the researchers suspected the lake's microbial fauna were responsible for the perchlorate degradation. Experiments confirmed a rapid microbial-based degradation in the absence of nitrate (NO_3^-). [Rhizodegradation is also hampered by the presence of nitrate, which is preferentially reduced by the bacteria in the root zone.] The results of the study suggests that at display sites with appropriate biogeochemical conditions, natural aquatic systems have the ability to remediate perchlorate released by the discharge of fireworks.

RECOMMENDATIONS

Towards minimizing long term environmental contamination with fireworks associated perchlorate, fireworks displays should be conducted whenever possible at sites rich in terrestrial and/or aquatic vegetation.

The normal paper and plastic fallout from the display including shell casing fragments, spent inserts, and, of course, unreacted pyrotechnics should be harvested where practicable and either processed by composting, incineration, or sent to an appropriate industrial landfill.

REFERENCES

1. U.S. Environmental Protection Agency's Office of Ground Water and Drinking Water web page: www.epa.gov/ogwdw000/ccl/perchlor/perchlo.html.
2. Urbansky, Edward T., "Perchlorate Chemistry: Implications for Analysis and Remediation", Biorem. J., 2(2), 81(1998).
3. Urbansky, Edward T., and M. R. Schock, "Issues in managing the risks associated with perchlorate in drinking water," J. Environ. Manag., 56, 79(1999).
4. USEPA, "Interim Drinking Water Health Advisory for Perchlorate," EPA 822-R-08-025, December 2008, http://www.epa.gov/waterscience/.
5. Clark, James J.J.., "Toxicology of Perchlorate," Chp. 3, in "Perchlorate in the Environment," Edward T. Urbansky, ed., Plenum Publishers, New York, 2000.
6. Pontius, Frederick W., Paul Damian and Andrew D. Eaton, "Regulating Perchlorate in Drinking Water," Chp. 4, in "Perchlorate in the Environment," Edward T. Urbansky, ed.,

Plenum Publishers, New York, 2000.

7. MacAllister, Irene E., Micahel G. Jakoby IV, Bruce Geryk, Roger L. Schneider and Donald M. Cropek, "Use of the thyrocyte sodium iodide symporter as the basis for a perchlorate cell-based assay," Analyst, 134, 320-324(2009).
8. U.S. Environmental Protection Agency "Announcement of the Analytical Method (EPA Method 314.0) and Laboratory Approval Process to Support Perchlorate Monitoring for the Unregulated Contaminants Monitoring Rule", Cincinnati, OH, 03FEB2000.
9. Schilt, Alfred A., "Perchloric Acid and Perchlorates," The G. Frederick Smith Chemical Co., Columbus, OH, 1979.
10. Yifru, Dawit D. and Valentine A. Nzengung, "Organic Carbon Biostimulates Rapid Rhizodegradation of Perchlorate," Environmental Toxicology and Chemistry, 27, 2419-2426(2008).
11. Minkel, J.R., "NASA Says Perchlorate Does Not Rule Out Life on Mars-Unexpected chemical in Martian soil is a food source for some Earthly microbes," Scientific American, August 5, 2008.
12. Schneider, Roger L., Philip G. Thorne, and John W. Hass, "Estimating the Firework Industry's Contribution to Environmental Contamination with Perchlorate," Proc., 6th International Symposium on Fireworks, pp 397-405, December 2001, Coronado Springs Resort, Orlando, FL, International Symposium on Fireworks, ISBN 0-660-18641-1.
13. DeBusk, Thomas A., Jeffrey J. Keaffaber, Benedict R. Schwegler, Jr., and John Repoff, "Environmental Effects of Fireworks on Bodies of Water," Proc., 1st International Symposium on Fireworks, May 1992, Montreal, Canada, Minister of Supply and Services Canada, Cat. No. M39-57/1992.
14. Van Aken, Benoit and Jerald L. Schnoor, "Evidence of Perchlorate (ClO_4^-) Reduction in Plant Tissues (Poplar Tree) Using Radio-Labeled $^{36}ClO_4^-$," Environmental Science &Technology, 36, 2783-2788(2002).
15. Yifru, Dawit D. and Valentine A. Nzengung, "Uptake of Perchlorate by Vegetation Growing in Arid and Subhumid Climates," Remediation Journal, 17, 53-68(2007).
16. Yifru, Dawit D. and Valentine A. Nzengung, "Uptake of N-Nitrosodimethylamine (NDMA) from Water by Phreatophytes in the Absence and Presence of Perchlorate as a Co-Contaminant," Environmental Science & Technology, 40, 7374-7380(2006).
17. Wilkin, Richard T., Dennis D. Fine, Nicole G. Burnett, "Perchlorate Behavior in Municpal Lake Following Fireworks Displays," Environmental Science & Technology, 41, 3966-3971(2007).

Rho Sigma Associates, Inc.

4906 North Idlewild Avenue
Whitefish Bay, Wisconsin 53217-5968
414-332-0138

03 March 2011

Mr. Joseph R. Bartolotta
President
Fireworks & Stage FX America
PO Box 488
Lakeside, CA 92040

Re: "Discharger" in CRWQCB Tentative Order (TO) No. R9-2011-0022, Draft 2/8/2011

Dear Joe,

Although the TO makes frequent reference to the term, Discharger(s), its definition is conspicuous by its absence in the TO's Attachment A-Definitions.

In Section II B, Discharger Eligibility Criteria, an "attempt" is made to define Discharger. It reads, "when a fireworks event(s) is sponsored by one person but is operated or conducted by another person, it is the sponsor's duty to submit an NOI and obtain coverage under this Order." This seems to imply, the Sponsor of a fireworks display is considered the Discharger, and by extension, the entity for which the 1000 lb. NEW monitoring-free limitation and the permitting requirement applies. But, following this "definition" of Discharger, the next sentence provided is, "The San Diego Water Board (SDWB) may require the joint submission of an NOI from both the sponsor and the person operating the fireworks event on a case-by-case basis." This second sentence surely muddies the water, so to speak. Does "joint submission" mean that the sponsor and the person operating the fireworks event, share, e.g., 50:50, the NEW for the specific event (display) to be charged against their respective 1000 lb. monitoring-free limitation, or is the NEW "charged" to just the sponsor, or does the SDWB have something else in mind? And, exactly what are the criteria for application of "case-by-case basis?"

Fortunately, the term, "person" is defined in the TO's Attachment A, so I can interpret the "person operating the fireworks event," as the display fireworks company, e.g., Fireworks & Stage FX America (FSFXA). If, on a case-by-case basis, the SDWB requires FSFXA to jointly submit an NOI with a display's sponsor, then there exist a serious threat to the viability of FSFXA.

Please consider the following scenarios, using the 350 lbs. NEW for your typical, medium-sized display.

(1) Independent of the location(s) of the displays, if the SDWB recognizes the sponsor as the exclusive discharger, then that sponsor would be able to do annually only two medium sized displays, with a total NEW of 700 lbs., so as not to exceed the monitoring-free limit. This may be a satisfactory situation for some, but certainly not

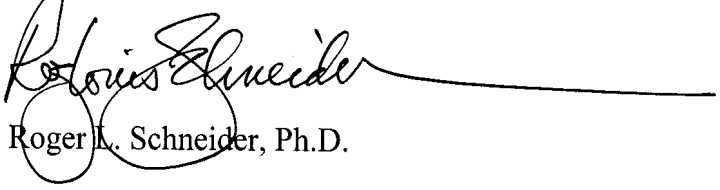
all of your customers.

(2) Independent of the location(s) of the displays, if the SDWB imposes a joint 50:50 allocation on you and the sponsor, then you would be able to conduct no more than five medium sized displays, with a total of 1,750 lbs, NEW, 875 lbs. charged to you, so as not to exceed the monitoring-free limit. As five display represents a very small percentage of the total number of displays FSFXA conducts annually, such a restriction would mean, of course, that most of the displays you conduct would require water monitoring. While this might be viewed positively as new business opportunities by the environmental monitoring firms, it would likely result in the elimination of many displays in the greater San Diego area, and the previously broached attendant threat to the viability of FSFXA.

(3) The TO refers to the Sponsor of the display in the singular. What happens if a display is sponsored by more than one sponsor? As a simple scenario, let's say there are two sponsors who split 50:50 the cost of the display, and SDWB considers this a case where only the "Sponsor" is the "Discharger." In this scenario, Sponsor A has already sponsored three displays in the San Diego Bay area and has 900 lbs. NEW charged against its annual 1000 NEW limit. This is Sponsor B's first display of the year. Does the SDWB split the 350 lbs. NEW for the display between the two sponsors, 50:50? If it does, then Sponsor A has an additional charge of 175 lbs. for a total of 1075 lbs NEW for the year, and thus the display will need to be monitored. Sponsor B then claims that it should not have to bear the additional costs for monitoring, because it has not exceeded its annual 1000 lb. limit. Potentially problematic, yes?

There are many similar scenarios which come to mind, with potential conflicts which have no clear resolution within the existing TO draft. Putting aside your arguments, with which I agree, that there is no demonstrable basis in fact for the need of a NPDES permit, I think the current TO is rife with so many ambiguities and inaccuracies so as make it unreasonably burdensome to the persons subject to its provisions.

Very truly yours,



Roger L. Schneider, Ph.D.

RLS/dbm

THE CREADORE LAW FIRM P.C.
305 BROADWAY – FOURTEENTH FLOOR
NEW YORK, NEW YORK 10007

Donald E. Creadore - NY, MO, CT, DC
Thomas D. Seymour – MA

Tel. 212.355.7200
Fax. 212.583.0412
Efax 212.822.1459

March 7, 2011

VIA ELECTRONIC MAIL
AND REGULAR MAIL
David W. Gibson, Executive Officer
c/o Michelle Mata mmata@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court – Suite 100
San Diego, CA 92123

In reply refer to:
Reg. Measure ID 375971: MMATA
Place 656901

Re: Comment Letter- 03/11/2011 Board Workshop- Fireworks Draft Permit

Dear Executive Director Gibson and Honorable Board Members:

This law firm represents the interests of the National Fireworks Association ("NFA"), and on its behalf we thank you for the opportunity to submit our comments and questions on revised Tentative Order No. R9-2010-0124, General Permit No.CAG99902 (the "Revised Tentative Order"). The implementation of the Revised Tentative Order by the San Diego Regional Water Quality Control Board ("Board") will impact numerous members of the NFA who work in the fireworks display industry within the areas that would become subject to this Board's jurisdiction; the additional fact that the Tentative Order is the first of its kind in the nation has far-reaching implications that can effect each of the 500+ active members of the NFA. Accordingly, the NFA submits this letter response (the "Letter Response") to the February 8, 2011 Notice of Public Workshop (the "Public Workshop Notice").

Realizing that it, like the Board, has a vested interest to fairly and responsibly address and resolve the issues raised by the Revised Tentative Order, the NFA has invested considerable time and money to engage the Board in a dialogue, while also allowing retained experts and consultants to explore and examine the relative merits of

the various facts and arguments underlying the Board's recently-expressed desire to regulate fireworks displays. In fact, in response to this Board's prior request for questions and comments (in connection with the prior public workshop), the NFA submitted a written response containing a detailed series of questions to the Board, each one deliberately designed to provide the NFA with a better understanding of prevailing facts and law influencing the Board's desire to now regulate public fireworks displays. The NFA is rightfully worried when a series of simple, fundamental and obvious questions go unanswered by the Board; and, for your convenience, a copy of the NFA's questions immediately follows this Letter Response. Given the absence of any meaningful information that would lead one to conclude that fireworks displays are subject to regulation by the Board under the NPDES program, the Board has seemingly exceeded its mandate and authority.

First and foremost, the NFA maintains that the Board lacks the legal authority to regulate the public display of fireworks. It is telling that the Board has not cited any precedent for its proposed exercise of authority, nor can it point to any specific statutory language supporting its contention that a public display of fireworks is a point source discharge within the plain terms or spirit of the Clean Water Act (the "CWA"). The unique qualities of fireworks displays further separates this activity from other properly regulated activities that fit comfortably within the Board's regulatory powers, such as sewage treatment plants, wastewater treatment facilities and local marinas. Fireworks display sites are temporary, and fireworks displays are, invariably, of relatively short duration; indeed, many occur only once per year. A balancing of the equities weighs heavily against burdening sponsors of fireworks displays—oftentimes, governmental or non-profit entities—with excessive enrollment and filing fees, coupled with sophisticated, and even more costly, water monitoring protocols. This is especially appropriate where, like here, there is an unexplained lack of engineering research or test results that argue or conclude that fireworks displays cause an adverse impact to the quality of "various receiving waters of the U.S." subject to the Revised Tentative Order.

It is worth repeating that the requirements of the Revised Tentative Order are not proportional to the activity sought to be regulated. Even were the NFA to find that the Board has a valid and legitimate right to regulate public fireworks displays, the NFA has credible cause to believe that the additional expense to comply with the requirements prescribed in the Revised Tentative Order will vastly exceed the present cost of the fireworks display, effectively eliminating fireworks displays that rely upon volunteer donations, and further burdening the budgets of municipalities that provide fireworks displays for its citizens.

The NFA realizes that subjecting public fireworks displays to the NPDES program will also cause irreparable damage to the industry and, more specifically, its members. The direct loss of revenues and jobs can, and will, be measured in the tens of millions of dollars in terms of lost earning and salaries, not to forget the additional tens of millions of dollars that will not flow into the cash registers of local businesses that derive

substantial annual revenues from fireworks displays in Mission Bay and San Diego Bay (e.g., bars, restaurants, charter boats and ferries, hotels and taxis). It would also stand to argue that these revenue streams dwarf any monies that government may receive from enrollment fees and filing fees or, alternatively, any benefit to the water quality of Mission Bay or San Diego Bay. The Board also appears to be overlooking the entertainment value and community spirit that public fireworks displays engender, which is priceless.

The NFA remains ready to assist this Board in achieving responsible regulation. To that end, the Board should withdraw all of the scheduled deadlines (see, Draft General Permit, at Table III), all of which are self-imposed and appear to be selected in an arbitrary and capricious manner. A thorough reading of Revised Tentative Order demonstrates that the Board still confronts more questions than it has answers.

For example, despite ample opportunity and scientific resources at its disposal, the Board openly admits that it is unable to satisfy the fundamental burden to "precisely specify the point(s) at which fireworks residue becomes a pollutant waste,". (Id., at III A, p. 10). Similarly, the Board may be confusing the term hazardous waste with the term hazardous material; to the extent that display fireworks have been customarily and traditionally treated nationwide as hazardous materials by manufacturers, industry and regulators, alike, it would be valuable and meaningful to understand why the Board is seeking more stringent requirements at this time. Given the fact that the Board's unsubstantiated finding (that public fireworks displays constitutes a point source discharge of pollutant waste) is also instrumental to its determination to subject public fireworks displays to the NPDES program, the Board's failure to thoroughly and unambiguously define the activity sought to be regulated is not only inexcusable but is doomed to generate unjustifiable and unintended results, causing irreparable injury and hardship. See Appendix A, attached. The NFA proposes that the Board act prudently by deferring the deadlines while further study of the prevailing science, law and public policy is undertaken.

In addition to the foregoing comments and prior communications, the NFA expressly reserves all rights to challenge the actions of the California Regional Water Quality Control Board, San Diego Region, in proceeding in this manner as a violation of various statutory provisions, including provisions of the Federal and State Administrative Procedures Act, as well as to demand legal and equitable relief, including injunctive relief and attorneys' fees.

Respectfully submitted,
THE CREADORE LAW FIRM, P.C.
Attorneys for the National Fireworks Association

Donald E. Creadore

QUESTIONS:

1. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks displays cause an adverse impact to the quality of either receiving waters or surface water and, if so, please identify?

2. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks displays can exceed prevailing actionable levels of reported pollutants to either receiving waters or surface waters and, if so, please identify?

3. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks displays cause acute or chronic toxicity in receiving waters or surface water and, if so, please identify?

4. Is the San Diego Water Board relying upon any scientific or engineering research or test results that substantiate the need for testing sediment at depths of 50' and, if so, please identify?

5. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that the display of fireworks "have the reasonable potential to cause or contribute to an exceedence of a water quality standard, including numeric and narrative objectives within a standard." And, if so, please identify?

6. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks products in sediments "in quantities that alone, or in combination, are toxic to benthic communities and, if so, please identify?

7. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks displays create "pollutants….in sediments at levels that will bio-accumulate in aquatic life to levels proven to be harmful to human health" and, if so, please identify?

8. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that public displays of fireworks *discharge pollutant wastes* to surface waters and, if so, please identify?

9. What information has the San Diego Water Board received from SeaWorld that establishes that fireworks have a demonstrable adverse impact upon the quality of either receiving waters or surface water?

10. Given that "Under the terms of the Tentative Order any person who discharges or proposes to discharge pollutant wastes from a public display of fireworks to surface waters in the San Diego region *may submit a Notice of Intent*..." (emphasis added), under what circumstances will a person be exempt or excused from having to file a Notice of Intent?

11. Can a sponsor seek a waiver of enrollment and, under what circumstances shall a waiver be provided, and upon what terms?

12. Upon what circumstances will the San Diego Water Board demand "the joint submission of an NOI from both the sponsor and the person operating the fireworks event."?

13. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks displays produce or generate wastewater and, if so, please identify?

14. Is the San Diego Water Board relying upon any studies that have determined that fireworks displays involve a process of production or manufacturing, and, if so, please identify?

15. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks are demonstrably equivalent to munitions or ammunition, and if so, please identify?

16. Is the San Diego Water Board relying upon any scientific or engineering research or test results that argue or conclude that fireworks display products constitute "pollutant wastes" as asserted in the Tentative Order, and if so, please identify?

17. What dispute process is available to Sponsors in the event that the Notice of Enrollment includes "additional or increased monitoring due to specific circumstances of the discharge,"?

18. Under what circumstances will the San Diego Water Board impose "additional or increased monitoring" requirements, and how and when will it do so?

19. Which receiving waters or surface waters are known to the San Diego Water Board to have documented and reported adverse impacts attributed specifically to particulate matter and miscellaneous debris associated with fireworks displays?

20. What background data did the San Diego Water Board rely upon in developing the requirements in the Order?

21. What studies to establish (water quality-based effluent limitations (WQBELs) have been conducted by the SDWB?

22. Why are sediment quality objectives being pursued in connection with an order relating to surface water and receiving waters?

23. What are the established effluent limits germane to fireworks displays intended to be enforced by the San Diego Water Board?

24. What are the established receiving water limits?

25. What are the "other requirements" referenced in the Order, (source, Tentative Order, page 12)?

26. Is the San Diego Water Board relying upon any scientific or engineering research or test results in deciding to impose Best Management Practices ("BMP") that are more stringent than current custom and practice and, if so, please identity?

27. How many sweeps of a fireworks display event satisfies the BMP as proposed in the Tentative Order? [BMP 'f']

28. What are "dangerous fireworks", and how are they materially different from display fireworks? [BMP 'e'].

29. How many fireworks display events does one permit cover?

30. Are all-volunteer organizations subject to the Tentative Order?

31. Can co-sponsors jointly apply and, if so, how?

32. Under the Tentative Order, are the terms "discharger" and "permittee" synonymous?

33. Can a 'Discharger' be determined to be liable under the terms of the Tentative Order where it is not an enrollee and, if so, under what circumstances?

34. Under what circumstances will the San Diego Water Board require a person to also apply for an individual NPDES permit?

35. What is the intended definition of "discharger" pursuant to the Tentative Order?

36. What is the intended definition of "receiving waters" pursuant to the Tentative Order?

37. What is the intended definition of "surface water" pursuant to the Tentative Order?

38. Is the San Diego Water Board relying upon any scientific or engineering report or study that either suggests or concludes that fireworks mortars are designed to function as conveyances of pollutants and, if so, please identify?

39. Is the San Diego Water Board relying upon any scientific or engineering report or study that either suggests or concludes that a mortar containing a finished, non-ignited fireworks shell is considered a non-point source?

40. Under what circumstances would the San Diego Water Board determine that the discharge from a fireworks display will not affect, or have the potential to affect, the quality of the waters of the state, prompting the refund of all or part of the annual fee?

41. Under what circumstances would the San Diego Water Board determine to extend a waiver to fireworks displays in accordance with § 13269 of the Porter-Cologne Water Quality Control Act (Ca. Water Code, Division 7)?

42. Under what circumstances would the San Diego Water Board determine to waive the monitoring requirements described in § 13269 of the Porter-Cologne Water Quality Control Act (Ca. Water Code, Division 7)?

43. Under what circumstances would the San Diego Water Board determine that the discharge from fireworks displays will not affect, or have the potential to affect, the quality of waters of the state, prompting a exemption in accordance with § 13269 of the Porter-Cologne Water Quality Control Act (Ca. Water Code, Division 7)?

APPENDIX

1. **State of California, Regional Water Quality Control Board, San Diego Region, Executive Officer Summary Report, December 12, 2007** ("SeaWorld conducted annual fireworks related monitoring of sediment and water quality parameters between 2001-2006 as part of the Coastal Commission permit requirement. The final monitoring report prepared for SeaWorld, by Science Applications International Corporation, concluded that there were no significant spatial or temporal patterns in concentration of critical metals in sea water or sediments in Mission Bay. It was also concluded that there is no indication of fireworks residue accumulation in the water or sediment of Mission Bay.") Accord, 2010 SeaWorld Aerial Fireworks Displays NPDES Permit Addendum Summary Report study provided to San Diego regional water quality control board (the Board expressly references the SeaWorld study in its Revised Tentative Order at Attachment F, 1D) ("Finding No. 5: SeaWorld conducted annual fireworks related monitoring of sediment and water quality parameters between 2001-2006 as part of the Coastal Commission permit requirement. The final monitoring report prepared for SeaWorld, by Science Applications International Corporation, concluded that there were no significant spatial or temporal patterns in concentration of key fireworks related metals in sea water or sediments in Mission Bay. It was also concluded that there is no indication of fireworks residue accumulation in the water or sediment of Mission Bay.")
2. **Environmental Assessment Of The Issuance Of A Small Take Regulations And Letters Of Authorization And The Issuance Of National Marine Sanctuary Authorizations For Coastal Commercial Fireworks Displays Within The Monterey Bay National Marine Sanctuary, California**, June 2006 ("NMFS and the MBNMS believe that chemical residue from fireworks does not pose a significant risk to the marine environment. No negative impacts to water quality have been detected." ; at p. 31).
3. **Results of SeaWorld Fireworks Sediment Monitoring Program Mission Bay, San Diego, March 2010 Sampling Event**, May 5, 2010 (upon information and belief, a full and complete copy of this private report is in the possession or control of the San Diego Water Board).
4. **Nautilus Environmental Letter of Transmittal and Analytical Report relating to July 4, 2010 Fireworks Monitoring Results (Big Bay Boom)**, (upon information and belief, a full and complete copy of this private report is in the possession or control of the San Diego Water Board)(monitoring at Shelter Island, Harbor Island, the Embarcadero and at Seaport Village "found that the vast majority of metals analyses results indicated that total concentrations either declined between pre-firework and post-firework sampling events, or increased less than 10 percent (an arbitrary value.)" .

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
(December 12, 2007)

ITEM: 10

SUBJECT: NPDES Permit Revision: SeaWorld San Diego. The Regional Board will consider amending SeaWorld's existing NPDES permit to establish waste discharge requirements for discharges of waste from SeaWorld's aerial fireworks displays to Mission Bay, San Diego. (Tentative Addendum No. 1 to Order No. 2005-0091, NPDES No. CA0107336) (Michelle Mata)

PURPOSE: Tentative Addendum No. 1 to Order No R9-2005-0091 NPDES No. CA0107336 would, if adopted, amend Order No. R9-2005-0091 for SeaWorld San Diego to establish waste discharge and monitoring requirements for their aerial fireworks displays over Mission Bay.

PUBLIC NOTICE: A Public Notice of this agenda item was published in the San Diego Union Tribune on November 8, 2007, for the Board Meeting scheduled for December 12, 2007. Copies of the tentative Addendum No. 1 were mailed out on November 2, 2007 to SeaWorld and to all known interested parties and agencies. The tentative Addendum was made available for public review via the Regional Board web page on November 5, 2007.

DISCUSSION: On October 23, 2007, SeaWorld San Diego submitted a Report of Waste Discharge (RWD), prepared by Brown and Caldwell, for an Amendment to Order No. R9-2005-0091, NPDES Permit No. CA0107336 for the discharge of wastes from SeaWorld's aerial fireworks displays over Mission Bay.

Fireworks displays have been a part of SeaWorld entertainment since 1968. From 1968 to 1985, fireworks were used for special events. In 1985, the frequency of fireworks displays increased to nightly from mid-June through Labor Day, and since 1997, the schedule has expanded to include three additional weekends starting Memorial Day weekend. Fireworks displays are also conducted for special events, private parties and

celebrations. The SeaWorld Master Plan Update, which was approved by the Coastal Commission in 2001, allows up to 150 shows per year. Currently the park averages between 110 and 120 shows per year.

The average fireworks show lasts 5 to 6 minutes and dispenses approximately 250 shells; special events, such as the 4th of July and New Year's Eve, may dispense between 1,000 and 1,750 shells. Fireworks are launched from a barge moored in the Pacific passage Zone of Mission Bay, between Fiesta Island and the SeaWorld shorelines. SeaWorld subcontracts the logistics of fireworks, operations, transportation, setup, ignition and cleanup to Fireworks America, a licensed pyrotechnics company based in Lakeside, CA.

There have been concerns over the possible environmental effects of fireworks displays on sediment and water quality. Constituents of concern include aluminum, magnesium, strontium, barium, sodium, potassium, iron, copper, sulfate, nitrate and perchlorate. These fireworks constituents have a potential to adversely impact and/or contribute to degradation of water and sediment quality within Mission Bay. In addition, debris from unexploded shells as well as paper, cardboard, wires and fuses from exploded shells can also adversely impact the quality within Mission Bay. The area affected by these debris can vary depending on wind speed and direction, size of the shells, height of the explosion, and other environmental and anthropogenic factors.

SeaWorld conducted annual fireworks related monitoring of sediment and water quality parameters between 2001-2006 as part of a Coastal Commission permit requirement. The final monitoring report prepared for SeaWorld, by Science Applications International Corporation, concluded that there were no significant spatial or temporal patterns in concentrations of critical metals in sea water or sediments in Mission Bay. It was also concluded that there is no indication of fireworks residue accumulation in the water or sediment of Mission Bay.

If adopted, Addendum No. 1 would establish waste discharge requirements (WDRs) for discharges of waste from SeaWorld's aerial fireworks displays to Mission Bay, San Diego. The WDRs include monitoring of water quality,

sediment and benthic infauna for fireworks related constituents.

Comments have been received from SeaWorld San Diego. A written Responses to Comments document and an Errata sheet will be included in the Supplemental Agenda Package.

KEY ISSUE:

1. Although the tentative Addendum includes a monitoring and reporting program designed to assess the potential adverse effects of fireworks related constituents on water quality, sediment and benthic infauna, the monitoring requirements may need to be revised after review of the data submitted to ensure that the program is adequate.

2. It is uncertain whether the current BMP's are sufficient in reducing impacts of fireworks related debris on water quality, sediment and benthic infauna. The BMP's will be reviewed periodically to evaluate their effectiveness and to determine if additional measures or changes to the current measures are needed.

LEGAL CONCERNS: None.

SUPPORTING DOCUMENTS:

1. Map
2. Transmittal letter for Tentative Addendum No. 1 to Order No. R9-2005-0091, NPDES No. CA0107336.
3. Tentative Addendum No. 1 No. R9-2005-0091, NPDES No. CA 0107336.
4. Order No. R9-2005-0091, NPDES No. CA0107336
5. Comment letter from SeaWorld San Diego dated November 28, 2007.

SIGNIFICANT CHANGES: The tentative Addendum would establish requirements for the SeaWorld aerial fireworks which were previously not regulated by the Regional Board.

COMPLIANCE RECORD: N/A – The discharge of fireworks wastes from SeaWorld has not previously been regulated by the Regional Board and, therefore, no compliance record has been established.

RECOMMENDATION(S): Adoption of Tentative Addendum No. 1 to Order No. 2005-0091, NPDES No. CA 0107336 is recommended.

ERRATA SHEET

ADDENDUM NO. 1 TO ORDER NO R9-2005-0091 NPDES NO. CA0107336

WASTE DISCHARGE REQUIREMENTS FOR SEAWORLD SAN DIEGO

The following changes have been made to tentative Addendum No. 1 to Order No. R9-2005-0091. Some changes/corrections below are shown in **bold and underline**/~~strikeout~~ format to indicate added and removed language, respectively.

Errata #	SECTION	REVISION
1.	Findings	The following text has been added as finding No. 1 and remaining findings have been renumbered accordingly: **On November 19, 2004, Anheuser Busch Inc. submitted a report of waste discharge (RWD) for the renewal of an NPDES permit to discharge up to 9.36 million gallons per day of treated wastewater from SeaWorld San Diego. The discharge consists of wastewater from exhibit pools, intermittent flows during pool drainage and cleaning operations, runoff from landscape irrigation, and facility wash down water. Order No. R9-2005-0091 was adopted by this Regional Board on April 13, 2005 and does not include any requirements for the aerial fireworks displays.**
2.	Finding No. 1	The following text will be revised as follows: On October 26, 2006, Brown and Caldwell submitted an incomplete report of waste discharge (RWD) on behalf of SeaWorld, San Diego for the discharge of waste to Mission Bay associated with their fireworks program. Additional information was requested on December 7, ~~2007~~ **2006** and received on January 19, 2007 to make the application complete. **Addendum No. 1 to Order No R9-2005-0091 specifically applies to the discharge of waste associated with the aerial fireworks displays. Addendum No. 1 to Order No. R9-2005-0091 does not include any changes of existing requirements of Order No. R9-2005-0091 for the discharge of treated wastewater.**
3.	Finding No. 2	The fireworks are launched from a barge located in the Pacific Passage Zone of Mission Bay, between Fiesta Island and the Sea World Shorelines. The average fireworks show lasts 5 to 6 minutes and dispenses approximately 250 shells **(3-inch and 4-inch)**; special events, such as the 4th of July and New Year's Eve, may dispense between 1,000 and 1,750 shells **(mostly 3-inch and 4-inch and some larger). The average total weight of firework related material that are used in shows at SeaWorld is 129 kilograms (kg) and the**

Errata #	SECTION	REVISION
		annual July 4th show is 993 kg. SeaWorld subcontracts the logistics of fireworks, operations, transportation, setup, ignition and cleanup and currently subcontracts that to Fireworks America, a licensed pyrotechnics company based in Lakeside, CA.
4.	Finding No. 3	Typical fireworks constituents include aluminum, magnesium, strontium, barium, sodium, potassium, iron, copper, sulfate, nitrate and perchlorate. ~~These constituents have a potential to adversely impact and/or contribute to degradation of water and sediment quality within Mission Bay.~~ In addition, debris from unexploded shells as well as paper, cardboard, wires and fuses from exploded shells can also adversely impact the quality within Mission Bay. The area affected by these debris can vary depending on wind speed and direction, size of the shells, and other environmental and anthropogenic factors. **These constituents have a potential to adversely impact and/or contribute to degradation of water and sediment quality within Mission Bay.**
5.	Finding No. 4	After each aerial fireworks display, crews conduct sweeps to gather floating debris from spent fireworks using handheld fishnets and a boom with a net off the bow. In addition, the fireworks barge is swept immediately after each show to prevent solid waste and debris from being swept into the water by the wind. Unexploded fireworks are disposed of by the fireworks subcontractor, who is currently Fireworks America. Fireworks debris deposited on Fiesta Island mainland is collected from the shorelines each morning following the aerial fireworks display. Solid waste typically consists of paper, paperboard or cardboard shells, and marginal amounts of wires and fuses.
6.	Finding No. 5	Sea World conducted annual fireworks related monitoring of sediment and water quality parameters between 2001-2006. The final monitoring report prepared for Sea World, by Science Applications International Corporation, concluded that there were no significant spatial or temporal patterns in concentrations ~~of critical metals~~ key fireworks related metals in sea water or sediments in Mission Bay. It was also concluded that there is no indication of fireworks residue accumulation in the water or sediment of Mission Bay.
7.	Section III Discharge Prohibitions	~~I. The discharge of waste from the aerial fireworks display shall be free of settleable material or substances that may form sediments, which will degrade benthic communities or other aquatic life.~~ I. The rate of deposition of inert solids and the characteristics of inert solids in Mission Bay sediments shall not be changed such that benthic communities are degraded.
8.	Attachment A-Definitions	The following text will be added to Attachment A: Degrade: Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only

<table>
<tr><th>Errata #</th><th>SECTION</th><th>REVISION</th></tr>
<tr><td></td><td></td><td>ones affected.</td></tr>
<tr><td>9.</td><td>Section III Discharge Prohibitions</td><td>~~J. Fireworks aerial displays shall be limited to the following dates: Easter through Labor Day and New Year's Eve of each year and shall not to exceed a maximum of 150 fireworks aerial displays per calendar year.~~

J. Fireworks aerial displays shall be in accordance with the following schedule and shall not exceed a maximum of 150 displays per calendar year:

<table>
<tr><th>Display Type</th><th>Approximate Show Length</th><th>Shell Average</th><th>Maximum Nights Per Year*</th></tr>
<tr><td>Typical</td><td>6 minutes</td><td>250 shells</td><td>129</td></tr>
<tr><td>Special</td><td>12 minutes</td><td>1000 shells</td><td>15</td></tr>
<tr><td>Major</td><td>20 minutes</td><td>1750 shells</td><td>6</td></tr>
</table>
*The maximum number of nights per year for a greater intensity display type may be transferred to a lesser intensity display type, provided that the total number of display nights does not exceed 150. Display intensity is defined by the approximate show length and average number of shells. Transferable display types are therefore limited to: 1) major to special; 2) special to typical; and 3) major to typical. Fireworks that reduce noise should be used.</td></tr>
<tr><td>10.</td><td>Section F.1</td><td>The following text has been deleted:

Beginning in April 2008, the Discharger shall implement a fireworks monitoring program that will continue until September 2010.</td></tr>
<tr><td>11.</td><td>Section F.3</td><td>Section F.3 has been modified as follows:

~~The following shall constitute the water quality monitoring locations:~~

<table>
<tr><th>~~Station Number~~</th><th>~~Location~~</th></tr>
<tr><td>~~RSW-001R~~</td><td>~~Area south of crown point shore and north of Vacation Isle shore~~
~~**Reference Station**~~</td></tr>
<tr><td>~~RSW-001~~</td><td>~~Pacific Passage, 20 feet from the fireworks barge and in the direction of the fireworks deposition zone~~</td></tr>
<tr><td>~~RSW-002~~</td><td>~~Pacific Passage, center of the deposition zone as determined after each event~~</td></tr>
</table></td></tr>
</table>

Errata #	SECTION	REVISION
		~~RSW-003~~ | ~~Pacific Passage, the outermost area of the fireworks deposition zone, at a point farthest away from the barge~~ The Discharger Shall submit for review and approval a Monitoring Location Plan to monitor water and sediment chemistry, sediment toxicity, and benthic infauna. The Monitoring Location Plan shall be submitted to the Regional Board no later than March 31, 2008. The fireworks monitoring program shall begin no later than July 2008 and continue through July 2010. The Monitoring Location Plan shall include, at a minimum, 3 locations within the fireworks deposition zone and 1 reference location.
12.	Section F.4	The following footnote No. 2 will be revised as follows: Samples shall be collected and analyzed ~~in January and July of each year~~ twice per year, once during the period of January-March and once during the period of July-Labor Day. Semiannually means at least once during the ~~months of January and July~~ first and third quarters. Water samples shall be collected immediately following a fireworks event.
13.	Section F.5	**Sediment Characteristics.** ~~The Discharger shall prepare a monitoring plan that identifies the locations of sediment monitoring. A minimum of 3 locations representative of the area of greatest potential impact and within the fireworks deposition zone shall be selected. All monitoring locations shall be approved by the Regional Board.~~
14.	Section F.6	**Infauna.** ~~The Discharger shall prepare a monitoring plan that identifies the locations of benthic infauna monitoring. A minimum of 3 locations representative of the area of greatest potential impact and within the fireworks deposition zone shall be selected. All monitoring locations shall be approved by the Regional Board.~~ For analysis of benthic infauna, two replicate samples of bottom sediment shall be collected and analyzed in January and July from a minimum of 3 locations. The benthic infaunal samples shall be collected using a 0.1-square meter modified Van Veen gran sampler. These grab samples shall be separated from those collected for sediment analyses. The samples shall be sieved using a 1.0 millimeter mesh screen. The benthic organisms retained on the sieve shall be fixed in 15 percent buffered formalin, and transferred to 70 percent alcohol within 2 to 7 days of storage. These organisms may be stained using Rose Bengal to facilitate sorting. Infaunal organisms, obtained during benthic monitoring shall be counted and identified to as low a taxon as possible. a. Number of species per 0.1-square meter b. Total number of species per station c. Total numerical abundance

Errata #	SECTION	REVISION
		d. Benthic Response Index (BRI) e. Swartz's 75 percent dominance index f. Shannon-Weiner's diversity index g. Pielou eveness (J) In addition to the community parameters, an annual evaluation shall be performed that includes more detailed statistical comparisons including community, temporal, and spatial analyses. Methods may include, but are not limited to, various multivariates, such as cluster analysis, ordination, and regression. Additionally analyses shall also be conducted, as appropriate, to elucidate temporal and spatial trends in the data. An additional array of 10 randomly selected ~~stations~~ locations within the fireworks deposition zone shall be sampled and analyzed annually for sediment chemistry and benthic infauna. The same procedures must be followed as outlined in F.5 and F.6, with the exception of the number of samples collected at each ~~station~~ location. Only one sample is required from each of the 10 randomly selected ~~stations~~ location. The ~~stations~~ locations shall be reselected each year by ~~USEPA~~ SeaWorld using the methods set forth in USEPA's probability-based Environmental Monitoring and Assessment Program. The area shall extend throughout the Pacific Passage. All randomly selected locations shall be approved the by Executive Officer. ~~The random benthic sampling requirement may be suspended as part of a resource exchange agreement to allow for participation in the Southern California BIGHT Regional Monitoring Surveys at the discretion of the Executive Officer. The benthic sampling may only be canceled for the year in which the BRIGHT Survey is conducted.~~
15.	Section F.8	An aerial 8 ½ x 11 map that clearly outlines the fireworks deposition zone shall be prepared ~~for each sampling event~~ by SeaWorld each year and approved by the Regional Board.
16.	Tentative Order (global)	Other typographical errors and other minor corrections to the wording in the tentative Order have been or will be made prior to sending out the final version.

ENVIRONMENTAL ASSESSMENT OF THE ISSUANCE OF A SMALL TAKE REGULATIONS AND LETTERS OF AUTHORIZATION AND THE ISSUANCE OF NATIONAL MARINE SANCTUARY AUTHORIZATIONS FOR COASTAL COMMERCIAL FIREWORKS DISPLAYS WITHIN THE MONTEREY BAY NATIONAL MARINE SANCTUARY, CALIFORNIA

National Oceanic and Atmospheric Administration
National Marine Fisheries Service and Monterey Bay National Marine Sanctuary

June, 2006

INTRODUCTION

A. Summary

On May 10, 2002, the National Marine Fisheries Service (NMFS) received an application from the Monterey Bay National Marine Sanctuary (MBNMS or the Sanctuary) requesting an Incidental Harassment Authorization (IHA) under section 101 (a)(5)(D) and a Letter of Authorization (LOA) under section 101 (a)(5)(A) of the Marine Mammal Protection Act (MMPA), for the possible harassment of small numbers of several species of marine mammals incidental to coastal commercial fireworks displays approved by MBNMS and occurring along the coastline within the Sanctuary, over California waters. Under the preferred alternative for this action, the LOA would be issued annually under 5-year regulations, which would take effect upon expiration of the one-year IHA. This Environmental Assessment (EA) is intended to jointly address impacts on the environment that would result from the issuance of the 5-year incidental take regulations (under the MMPA) and subsequent issuance of National Marine Sanctuary Authorizations for fireworks displays in the MBNMS (under the National Marine Sanctuaries Act (NMSA)).

B. Background

The MBNMS was designated as the ninth national marine sanctuary in the United States on September 18, 1992. Managed by the National Marine Sanctuary Program (NMSP) within the National Oceanic and Atmospheric and Atmospheric Administration (NOAA), the MBNMS adjoins 276 miles (444 km) of central California's outer coastline (overlaying 25 percent of state coastal waters), and encompasses 5,300 square miles of ocean waters from mean high tide to an average of 25 miles (40 km) offshore between Rocky Point in Marin County and Cambria in San Luis Obispo County.

Federal regulations governing activities within the MBNMS became effective on January 1, 1993. The MBNMS was the first national marine sanctuary to be designated along urban shorelines and, when first designated, became the largest marine sanctuary in the United States, equal in area to 77 percent of all other Federal marine sanctuaries in existence at the time. As a result of its large size and near proximity to urban areas, the MBNMS has addressed many regulatory issues not previously encountered by the NMSP. Authorization of professional fireworks displays is one such issue that has required a steady refinement of policies and procedures to limit the location, timing, and composition of professional fireworks events as more has been learned about its impacts to the Sanctuary and effects on the environment. The Sanctuary has monitored individual displays over the years to improve its understanding of their characteristics and potential impacts to Sanctuary resources.

Fireworks displays have been conducted over current Sanctuary waters for many years as part of national and community celebrations (such as Independence Day and municipal anniversaries) and to foster public use and enjoyment of the marine environment. The marine venue for this activity is the preferred setting for fireworks in central California in order to optimize public access and avoid the fire hazard associated with terrestrial display sites. Many

fireworks displays occur at the height of the dry season in central California, when area vegetation is particularly prone to ignition from sparks or embers. The MBNMS has worked diligently to balance these needs with its primary mandate for marine resource protection.

II. PURPOSE AND NEED FOR THE ACTIONS

A. Request for Incidental Take under the MMPA

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1361 et seq.) directs the Secretary of Commerce (the Secretary) to allow, upon request, the incidental, but not intentional taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and regulations are issued.

Authorization for incidental takings may be granted if the Secretary finds that the taking will have a negligible impact on the species or stock(s); will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses; and the permissible methods of taking and requirements pertaining to the monitoring and reporting of such taking are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Except with respect to certain activities not relevant here, the MMPA, as amended, now defines "harassment" as "...any act of pursuit, torment, or annoyance which (a) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (b) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]."

The MBNMS determined that authorizing fireworks displays above the MBNMS might potentially disturb marine mammals and, accordingly, submitted an application in 2002 for a 5-year rule, authorizing take, by harassment, of a small number of California sea lions and Pacific harbor seals incidental to fireworks displays. If the action proposed in the small take application will have no more than a negligible impact on the species or stock, will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses, and the permissible methods of taking and required monitoring are set forth, then the NMFS shall issue the regulations. NMFS would then issue an LOA to the MBNMS each year that the rule is in effect, provided MBNMS complied with the previous LOA's mitigation, monitoring, and reporting requirements and no unauthorized take occurred during the previous year. The purpose of the 5-year rule and LOAs is to investigate the status of the marine mammals that may be impacted by the action, set forth the types and amount of take that may occur, and list the mitigation and monitoring required to ensure the least practicable impact to marine mammal species.

B. Issuance of Marine Sanctuary Authorizations for Fireworks under the NMSA

Section 308 of the NMSA authorizes the Secretary of Commerce to issue such regulations as may be necessary to protect National Marine Sanctuary resources and qualities, among other purposes. Accordingly, the Secretary promulgated regulations in Title 15 of the Code of Federal Regulations (15 CFR), section 922.132(a) prohibiting several activities within the MBNMS as environmental protection measures, including unauthorized discharges into Sanctuary waters and harassment of marine mammals, seabirds, and sea turtles. The Secretary may grant specific exceptions to otherwise prohibited activities under special circumstances. Sections 922.49 and 922.132(e) of Title 15 CFR allow the Secretary to authorize any valid Federal, State, or local lease, permit, license, approval, or other authorization for activities within the MBNMS that would otherwise be prohibited under Sanctuary regulations, provided the applicant complies with any terms and conditions to protect Sanctuary resources and qualities.

Coastal fireworks displays within the MBNMS result in discharges of debris into Sanctuary waters, incidental harassment of wildlife, and potential negative impacts to habitat; such incidental impacts are prohibited by MBNMS regulations. The MBNMS has developed an extensive list of terms and conditions designed to minimize the impacts of fireworks displays within the Sanctuary. Coastal fireworks displays over the MBNMS generally require Federal, state, and or local permits that address public safety and coastal access. The Secretary of Commerce has delegated authority to the MBNMS Superintendent to authorize such permits (i.e. approve the activity if the Superintendent determines that terms and conditions may be applied to the activity that adequately protect Sanctuary resources and qualities.

This EA, in addition to assessing impacts of coastal fireworks displays upon marine mammals pursuant to the MMPA, analyzes impacts of fireworks displays upon the broader resources and qualities of the MBNMS. If it is determined that coastal fireworks displays can be conducted in a manner that safeguards Sanctuary resources and qualities, then the MBNMS may issue authorizations of other valid Federal, State, and local fireworks approvals for up to 5-year periods, with terms and conditions that mitigate negative impacts.

III. DESCRIPTION OF ACTIVITY TO BE COVERED BY PROPOSED MMPA LOAs AND MBNMS AUTHORIZATIONS

A. Description of Fireworks Displays Authorized by MBNMS

The activity to be conducted is the display of commercial-grade fireworks in the atmosphere and at ground or sea level. Since 1993, the MBNMS, a component of NOAA, has processed requests for the professional display of fireworks that affect the Sanctuary and its resources. The MBNMS has determined that debris fallout (spent pyrotechnic materials) from fireworks events constitute a discharge into the Sanctuary and thus a violation of Sanctuary regulations, unless written authorization is secured from the Sanctuary. Therefore, sponsors of fireworks displays conducted in the MBNMS are required to obtain Sanctuary authorization prior to conducting such displays.

Since 1993, the MBNMS has received a total of 79 requests for professional fireworks displays and has issued 67 Authorizations, the majority of which have been associated with large community events such as Independence Day and municipal festivals. The Sanctuary redirected at least 4 displays away from the Sanctuary and 2 applications are currently (as of March 2006) being processed. However, the Sanctuary projects that as many as 20 coastal displays per year may be conducted in, or adjacent to, the MBNMS boundaries in the future. The number of "public" fireworks displays within the Sanctuary has remained relatively constant over time. "Private" fireworks displays averaged one per year from 1993 to 2000. But within a six-month period from October 2000 to March 2001, the MBNMS received four requests for private displays in the Sanctuary, and information suggests that such requests could increase in the future. Table 1 presents a relative comparison of the types of fireworks events authorized by the MBNMS between 1993 and 2005.

Fireworks Event Category	Percentage of Total Fireworks Permits Issued
Independence Day Festivals	45%
City Festivals	28%
Private Events	27%

Table 1. Percentage of total fireworks Authorizations issued by event.

In considering requests to conduct fireworks displays, the MBNMS has consulted biologists from state and federal agencies and universities, local property managers and residents, environmental sensitivity index (ESI) maps prepared for the California Department of Fish and Game (CDFG) and NOAA, other environmental maps, and both published and unpublished resources. As a result, the MBNMS has added special conditions to fireworks Authorizations that are designed to minimize fireworks impacts upon resources and qualities. Jointly developed by the MBNMS, NMFS Southwest Region, and the U.S. Fish and Wildlife Service (USFWS), the special Authorization conditions help assure that protected species and habitats are not jeopardized by this activity.

Deleted: guidelines were developed to

However, the application of individual Authorization conditions alone are not sufficient to assure that protected species will be adequately safeguarded from potential cumulative impacts of fireworks activity within the Sanctuary. NMFS and the USFWS thus support additional conservation measures described in sections (VI)(A)(4) and (VII)(A).

B. Description of Pyrotechnic Devices

Professional pyrotechnic devices used in firework displays can be grouped into three general categories: aerial shells (paper and cardboard spheres or cylinders ranging from 2 inches to 12 inches in diameter and filled with incendiary materials), low-level comet and multi-shot devices similar to over-the-counter fireworks such as roman candles, and set piece displays that are mostly static in nature and are mounted on the ground.

Aerial shells are launched from tubes (called mortars), using black powder charges, to altitudes of 200 to 1000 feet where they explode and ignite internal burst charges and incendiary chemicals. Most of the incendiary elements and shell casings burn up in the atmosphere; however, portions of the casings and some internal structural components and chemical residue fall back to the ground or water, depending on prevailing winds. An aerial shell casing is constructed of paper/cardboard or plastic and may include some plastic or paper internal components used to compartmentalize chemicals within the shell. Within the shell casing is a burst charge (usually black powder) and a recipe of various chemical pellets (stars) that emit prescribed colors when ignited. Table 2 describes a list of chemicals that are commonly used in the manufacturing of pyrotechnic devices. Manufacturers consider the amount and composition of chemicals within a given shell to be proprietary information and only release aggregate descriptions of internal shell components. The arrangement and packing of stars and burst charges within the shell determine the type of effect produced upon detonation.

Common Contents of Pyrotechnic Devices		
Potassium Chlorate	Strontium Nitrate	Iron
Potassium Perchlorate	Strontium Carbonate	Titanium
Potassium Nitrate	Sulfur	Shellac
Sodium Benzoate	Charcoal	Dextrine
Sodium Oxalate	Copper Oxide	Phenolic Resin
Ammonium Perchlorate	Polyvinyl Chloride	Aluminum

Table 2. List of chemicals commonly used in manufacture of polytechnic devices.

Attached to the bottom of an aerial shell is a lift charge of black powder. The lift charge and shell are placed at the bottom of a mortar that has been buried in earth/sand or affixed to a wooden rack. A fuse attached to the lift charge is ignited with an electric charge or heat source, the lift charge explodes, and propels the shell through the mortar tube and into the air to a height determined by the amount of powder in the lift charge and the weight of the shell. As the shell travels skyward, a time-delay secondary fuse is burning that eventually ignites the burst charge within the shell at peak altitude. The burst charge detonates, igniting and scattering the stars, which may, in turn, possess small secondary explosions. Shells can be launched one at a time or in a barrage of simultaneous or quick succession launches. They are designed to detonate between 200 and 1000 feet above ground level (AGL).

In addition to color shells (also known as designer or starburst shells), a typical fireworks show will usually include a number of aerial "salute" shells. The primary purpose of salute shells is to announce the beginning and end of the show and produce a loud percussive audible effect. These shells are typically two to three inches in diameter and packed with black powder to produce a punctuated explosive burst at high altitude. From a distance, these shells sound similar to cannon fire when detonated.

Low-level devices consist of stars packed linearly within a tube, and when ignited, the stars exit the tube in succession producing a fountain effect of single or multi-colored light as the stars incinerate through the course of their flight. Typically, the stars burn rather than explode, thus producing a ball or trail of sparkling light to a prescribed altitude where they simply extinguish. Sometimes they may terminate with a small explosion similar to a firecracker. Other low-level devices emit a projected hail of colored sparks or perform erratic low-level flight while emitting a high-pitched whistle. Some emit a pulsing light pattern or crackling or popping sound effects. In general, low-level launch devices and encasements remain on the ground or attached to a fixed structure and can be removed upon completion of the display. Common low-level devices are multi-shot devices, mines, comets, meteors, candles, strobe pots and gerbs. They are designed to produce effects between 0 and 200 feet AGL.

Set piece or *ground level* fireworks are primarily static in nature and remain close to the ground. They are usually attached to a framework that may be crafted in the design of a logo or familiar shape, illuminated by pyrotechnic devices such as flares, sparklers and strobes. These fireworks typically employ bright flares and sparkling effects that may also emit limited sound effects such as cracking, popping, or whistling. Set pieces are usually used in concert with low-level effects or an aerial show and sometimes act as a centerpiece for the display. It may have some moving parts, but typically does not launch devices into the air. Set piece displays are designed to produce effects between 0 and 50 feet AGL.

Each display is unique according to the type and number of shells, the pace of the show, the length of the show, the acoustic qualities of the display site, and even the weather and time of day. The vast majority (97 percent) of fireworks displays authorized in the Sanctuary between 1993 and 2005 were aerial displays that usually include simultaneous low-level displays. An average large display will last 20 minutes and include 700 aerial shells and 750 low-level effects. An average smaller display lasts approximately 7 minutes and includes 300 aerial shells and 550 low-level effects. There seems to be a declining trend in the total number of shells used in aerial displays, due to increasing shell costs and/or fixed entertainment budgets. Low-level displays sometimes compensate for the absence of an aerial show by squeezing a larger number of effects into a shorter timeframe. This results in a dramatic and rapid burst of light and sound effects at low level. A large low-level display may expend 4,900 effects within a seven-minute period, and a small display will use an average of 1,800 effects within the same timeframe. Some fireworks displays are synchronized with musical broadcasts over loudspeakers and may incorporate other non-pyrotechnic sound and visual effects. Table 3 provides a comparison of fireworks displays performed within the Sanctuary in the past.

Display Types	Duration of Display	Number of Aerial Effects	Number of Low-level Effects	Number of Set-Piece Devices
Aerial, Small	5 Minutes	300	550	0
Aerial, Large	20 Minutes	700	750	1
Aerial, Largest to Date	25 Minutes	1700	1800	0
Low-level, Small	7 Minutes	0	1800	0
Low-level, Large	7 Minutes	0	4900	1

Table 3. Comparison of fireworks displays performed within MBNMS in the past (as of 2005).

IV. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. Issuance of LOAs and Sanctuary Authorizations for 20 Fireworks Displays Annually (Preferred Alternative)

The preferred alternative is for NMFS to issue annual LOAs to MBNMS for up to five years, authorizing the incidental take, by Level B harassment, of a small number of California sea lions and Pacific harbor seals for up to 20 fireworks displays per year within the MBNMS boundaries. The MBNMS would then exercise its regulatory authority to issue Authorizations to applicants seeking permission to conduct fireworks displays within the MBNMS. The potential impacts to marine mammals from a LOA would be as described in section (VI)(A) of this document. Potential impacts to other Sanctuary resources from issuance of Sanctuary Authorizations are also described in section (VI)(A). Under this alternative, the mitigation measures and reporting requirements described in section (VII) will be incorporated into the LOAs and Sanctuary Authorizations. NMFS has determined that the fireworks displays MBNMS proposes to authorize would result in the taking by Level B harassment of only small numbers of marine mammals and have no more than a negligible impact on affected stocks. The MBNMS has determined that issuance of Sanctuary Authorizations for a limited number of fireworks displays under certain conditions and terms will not exceed negligible short-term impacts upon Sanctuary resources and qualities.

A description of the activity to be covered by the proposed LOAs and Sanctuary Authorizations was provided above. A further-detailed description of the fireworks displays authorized at MBNMS may be found in the application and the 2001 Assessment of Pyrotechnic Displays and Impacts within the MBNMS.

B. Issuance of LOAs and Sanctuary Authorizations for 7 Fireworks Displays Annually

Another alternative is for NMFS to issue annual LOAs to MBNMS for up to five years authorizing the incidental take, by Level B harassment of a small number of California sea lions and Pacific harbor seals over the course of 7 fireworks displays per year authorized by MBNMS that occur within the MBNMS boundaries. The potential impacts to marine mammals would be

as described in section (VI)(B). Under this alternative, the mitigation measures and reporting requirements described in Section (VII) would be incorporated into the LOAs and Sanctuary Authorizations. NMFS has determined that the fireworks displays MBNMS proposes to authorize would result in the harassment taking of only small numbers of marine mammals. The MBNMS has determined that issuance of Sanctuary Authorizations for a limited number of fireworks displays under certain conditions and terms will not exceed negligible short-term impacts upon Sanctuary resources and qualities.

C. Issuance of LOAs to Individual Fireworks Sponsors

A third alternative is for NMFS to issue annual LOAs to individual sponsors (e.g. municipalities, civic organizations, commercial companies) of fireworks displays within the coastal area of the MBNMS. The potential impacts to marine mammals would be as described in section (VI)(B). Under this alternative, many of the mitigation measures and reporting requirements described in Section (VII) would be incorporated into LOAs, except that MBNMS Authorization provisions would not apply. This alternative would require submission of multiple application requests and a case-by-case assessment of proposed fireworks displays by NMFS, since the MBNMS will not be serving in a coordinating role regarding MMPA requirements. This alternative would also necessitate monitoring and individual reporting by fireworks sponsors instead of consolidated reporting by the MBNMS on their behalf. Individual fireworks sponsors will be fully responsible for compliance with the terms and conditions of LOAs issued for displays conducted under their supervision.

D. No Action Alternative

The No Action Alternative would not involve the issuance of LOAs and Sanctuary Authorizations for fireworks displays within the MBNMS. The MMPA prohibits all takings of marine mammals unless authorized by a permit or exempted under the MMPA. If an authorization to incidentally take California sea lions and Pacific harbor seals were denied, the applicant could choose to amend the project to avoid harassing marine mammals or choose not to pursue the project at that location. Execution of the project without a take authorization could result in the incidental take of marine mammals in violation of the MMPA. Impacts to marine mammals would vary between no takes if fireworks are not conducted to impacts similar to those assessed for 20 displays.

If no Sanctuary Authorizations were issued for coastal fireworks displays, such displays would have to be cancelled or moved to inland sites. Execution of such displays without the issuance of Sanctuary Authorizations would likely result in the discharge of debris into Sanctuary waters and the disturbance of wildlife in violation of Sanctuary regulations.

V. DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Display Areas

The Monterey Bay area is located in the Oregonian province subdivision of the Eastern Pacific Boreal Region. The six types of habitats found in the bay area are: (1) submarine canyon habitat, (2) nearshore sublittoral habitat, (3) rocky intertidal habitat, (4) sandy beach intertidal habitat, (5) kelp forest habitat, and (6) estuarine/slough habitat. Pyrotechnic displays within the Sanctuary are conducted from a variety of coastal launch sites - beaches, bluff tops, piers, offshore barges, and golf course sand traps and tee boxes. In the past, authorized displays have been confined to eight general locations in the Sanctuary. However, these regulations authorize displays in only four prescribed areas within the Sanctuary. These sites are approved for fireworks events based on their proximity to urban areas and pre-existent high human use patterns, seasonal considerations such as the abundance and distribution of marine wildlife, and the acclimation of wildlife to human activities and elevated ambient noise levels in the area.

The four "conditional" display areas (areas authorized for displays under the NMFS regulation subject to terms and conditions imposed by MBNMS) are located at Half Moon Bay, the Santa Cruz/Soquel area, the northeastern Monterey Peninsula, and Cambria (Santa Rosa Creek). Under the preferred alternative, no more than 20 events per year may be authorized within these four specific areas of the Sanctuary's 276 mi (444 km) of coastline are authorized by this regulation.

The conditional display areas for fireworks displays must first be described in order to understand which marine mammals in the area may be affected by the activity. Monterey Bay supports a wide array of temperate cold-water species with occasional influxes of warm-water species, and this species diversity is directly related to the diversity of habitats.

1. Half Moon Bay

Site Description – The site has been used annually for a medium-sized Independence Day fireworks display on July 4, which lasts about 20 minutes. The launch site is on a sandy beach inside and adjacent to the east outer breakwater, upon which the aerial shells are launched and aimed to the southwest. The site is often fogged in during summer months. The marine venue adjacent to Pillar Point Harbor is preferred for optimal public access and to avoid the fire hazard associated with terrestrial display sites. The fireworks display occurs at the height of the dry season in central California, when area vegetation is particularly prone to ignition from sparks or embers.

Human Use Patterns – The harbor immediately adjacent to the impact area is home to a major commercial fishing fleet that operates at all times of the day and night throughout the year. The harbor also supports a considerable volume of recreational boat traffic. Half Moon Bay Airport (HAF) is located adjacent to the harbor, and approach and departure routes pass directly over the impact area. The airport is commonly used by general aviation pilots for training, with an annual average attendance of approximately 15 flights per day. On clear sunny weekends, the

airport may accommodate as many as 50 flights in a single day. Beachgoers and water sport enthusiasts use the beaches to the south of the launch site. The impact area is also used by recreational fishermen, surfers, swimmers, boaters, and personal watercraft operators. To the north, around Pillar Point is an area known as "Mavericks" considered a world-class surfing destination. Periodically, surfing contests are held at Mavericks. The impact area is also subjected to daily traffic noise from California Highway 1, which runs along the coast and is the primary travel route through the area.

Marine Mammals – A considerable concentration of harbor seals are present to the north around Pillar Point and on the coast to the south of the launch site. Within the Half Moon Bay area, depending on time of year and local environmental factors, MBNMS has estimated that an average of 20 sea lions (100 maximum) and an average of 15 harbor seals (65 maximum) may be present during a fireworks display. Sea otters are not concentrated in the impact area, though some individuals may be present. It is possible that individual elephant seals may enter the area from breeding sites at Año Nuevo Island and the Farallon Islands, but breeding occurs in the winter and displays in Half Moon Bay are limited to summer. Gray whales typically migrate west of the reefs extending south from Pillar Point.

Other Marine Wildlife – Resource information and discussions with area biologists indicate that snowy plover are present within 2 statute miles to the south of the launch site. Brown pelicans, gulls, cormorants, and other marine birds are present in the harbor where they roost on piers and other structures or rest on the calm waters within the breakwater.

2. Santa Cruz/Soquel

Site Description – Three separate fireworks display sites (Santa Cruz, Capitola, and Aptos) are located within the Santa Cruz/Soquel area. The Santa Cruz launch site has been used annually for City anniversary fireworks displays in early October. The launch site is on a sandy beach, adjacent to the Santa Cruz Boardwalk and the San Lorenzo River and along the west bank. The aerial shells are aimed to the south. The site is sometimes fogged in during summer months.

The Capitola launch site has been used only once since 1993 for a 50-year City anniversary fireworks display on May 23, 1999. This display was the largest volume fireworks display conducted in the MBNMS to date, incorporating 1700 aerial shells and 1800 low-level effects and lasting 25 minutes. The launch site was on the Capitola Municipal Pier, adjacent to the City of Capitola. The aerial shells were aimed above the pier. The site is sometimes fogged in during summer months.

The Aptos site has been used annually for a large fundraiser for Aptos area schools in October. The launch site is on the Aptos Pier and part of a grounded cement barge at Seacliff State Beach. The aerial shells are aimed above and to the south of the pier. The site is sometimes fogged in during summer months. The large aerial show lasts for approximately 20 minutes.

Human Use Patterns – The harbor immediately adjacent to the Santa Cruz impact area is home to a commercial fishing fleet that operates at all times of the day throughout the year. The harbor primarily supports a large volume of recreational boater traffic. The launch site is in the center of the shoreline of a major urban coastal city. The beaches to the west of the launch site are adjacent to a large coastal amusement park complex and are used extensively by beachgoers and water sport enthusiasts from the local area as well as San Jose and San Francisco. The impact area is used by boaters, recreational fishermen, swimmers, surfers, and other recreational users. Immediately southwest of the launch site is a mooring field and the Santa Cruz Municipal Pier which is lined with retail shops, restaurants, and offices. To the west of the pier is a popular local surfing destination known as "Steamer Lane." Surfing contests are routinely held at the site. During the period from sunset through the duration of the fireworks display, 40-70 vessels anchor within the impact area to view the fireworks. Vessels criss-cross through the waters south of the launch site to take up position. In addition, U. S. Coast Guard and harbor patrol vessels motor through the impact area to maintain a safety zone around the launch site.

The Capitola impact area is immediately adjacent to a small urban community. The beaches to the east and west of the launch site are used daily by beachgoers and water sport enthusiasts from the regional area. The impact area is used by boaters, recreational fishermen, swimmers, surfers, and other recreational users. To the east of the Pier is a mooring field and popular public beach.

The Aptos impact area is immediately adjacent to a recreational beach. The beaches to the east and west of the launch site are used daily by beachgoers and water sport enthusiasts from the regional area. The impact area is used by boaters, recreational fishermen, swimmers, surfers, and other recreational users, but typically at moderate to light levels of activity. To the east and west of the Pier are public use beach areas and private homes at the top of steep coastal bluffs. During the period from sunset through the duration of the fireworks display, 30-40 vessels anchor within the impact area to view the fireworks. Vessels criss-cross through the waters seaward of the cement barge to take up position. In addition, U. S. Coast Guard and State Park Lifeguard vessels motor through the impact area to maintain a safety zone around the launch site.

Marine Mammals – California sea lions routinely use the Santa Cruz Municipal Pier as a haulout and resting site. Sea otters are moderately concentrated in the impact area, primarily around the nearshore kelp forests. Within the Santa Cruz/Soquel area, depending on time of year, specific launch site, and local environmental factors, MBNMS has estimated that an average of 0-100 sea lions (5-190 maximum) and an average of 0-15 harbor seals (5-50 maximum) may be present during a fireworks display. Gray whales typically migrate along a southerly course, west of Point Santa Cruz and away from the pier. Sea otters are moderately concentrated in the impact areas near the Capitola Municipal Pier and Aptos Pier, primarily in and around the nearshore kelp forests. At the seaward end of the Aptos Pier is a 400-foot grounded cement barge. The barge was set in position as an extension of the pier, but has since been secured against public access. The exposed interior decks of the barge have created convenient haulout surfaces for harbor seals. In a 2000 survey, the MBNMS recorded as many as 45 harbor seals hauled out on the barge in the month of October.

Other Marine Wildlife – The Santa Cruz Municipal Pier is a roost for a large number of gulls, Brown pelicans, and other marine birds. Brown pelicans, cormorants, gulls, and other marine birds routinely use the Capitola Municipal Pier as a roosting site. Seabirds also often gather on the sand beach at the mouth of Soquel Creek where a lagoon forms in the summer. The creek empties into the ocean immediately east of the Municipal Pier. Brown pelicans, cormorants, gulls, and other marine birds routinely use the Aptos cement barge (described above) as a roosting site. The barge has broken into two parts isolating the bow section from the rest of the vessel. The isolated bow section is particularly favored by pelicans and cormorants, and contains the bulk of roosting seabirds. Black turnstones seem to favor the interior spaces of the vessel along the aft section, and gulls attend the upper portions of the aft superstructure. Approximately 1/2 statute miles to the east of the pier is the mouth of Aptos Creek where shorebirds congregate.

3. Monterey Peninsula

Site Description – Two separate fireworks display sites (City of Monterey and Pacific Grove) are located within the Monterey Peninsula Area. Each Independence Day, the City of Monterey launches approximately 750 shells and an equal number of low-level effects from a barge anchored approximately 1000 feet east of Municipal Wharf II and 1000 feet north of Del Monte Beach. The aerial shells are aimed above and to the northeast. The site is often fogged in during summer months. The City's display lasts approximately 20 minutes and is accompanied by music broadcasted from speakers on Wharf II. The marine venue adjacent to Monterey Harbor is preferred for optimal public access and to avoid the fire hazard associated with terrestrial display sites. The fireworks display occurs at the height of the dry season in central California, when area vegetation is particularly prone to ignition from sparks or embers. Since 1999, a Monterey New Year's festival has used the City's launch barge for an annual fireworks display. The medium-size aerial display lasts approximately 8 minutes. In addition, three private displays (1993, 1998, and 2000) have been authorized from a launch site on Del Monte Beach. The 1993 display was an aerial display. Subsequent displays have been low-level displays, lasting approximately 7 minutes.

The Pacific Grove site has been used annually for a "Feast of Lanterns" fireworks display in late July. The Feast of Lanterns is a community event that has been celebrated in the City of Pacific Grove for over 95 years. The fireworks launch site is at the top of a rocky coastal bluff adjacent to an urban recreation trail and public road. The aerial shells are aimed to the northeast. The site is often fogged in during summer months. The small aerial display lasts approximately twenty minutes and is accompanied by music broadcasted from speakers at Lover's Cove. The fireworks are part of a traditional outdoor play that concludes the festival. The marine venue is preferred for optimal public access and to avoid the fire hazard associated with terrestrial display sites. The fireworks display occurs at the height of the dry season in central California, when area vegetation is particularly prone to ignition from sparks or embers.

Human Use Patterns – The Monterey fireworks impact area lies directly under the approach/departure flight path for Monterey Peninsula Airport (MRY) and is commonly exposed to noise and exhaust from general aviation, commercial, and military aircraft at approximately

500 feet altitude. The airport supports approximately 280 landings/takeoffs per day in addition to touch-and-goes (landing and takeoff training). Commercial and recreational vessels operate in the area during day and night hours from the adjacent harbor. A 30-station mooring field lies within the impact area between the launch barge and Municipal Wharf II. The moorings are completely occupied during the annual fireworks event. Auto traffic and emergency vehicles are audible from Lighthouse and Del Monte Avenues, main transportation arteries along the adjacent shoreline. The impact area is utilized by thousands of people each week for boating, kayaking, scuba diving, fishing, swimming, and harbor operations. During the period from sunset through the duration of the fireworks display, 20-30 vessels anchor within the impact area to view the fireworks. Vessels criss-cross through the waters south of the launch site to take up position. In addition, U. S. Coast Guard and harbor patrol vessels motor through the impact area to maintain a safety zone around the launch site.

The Pacific Grove launch site is in the center of an urban shoreline, adjacent to a primary public beach in Pacific Grove. The shoreline to the east and west of the launch site is lined with residences and a public road and pedestrian trail. The impact area is used by boaters, recreational fishermen, swimmers, surfers, divers, beachgoers, tidepoolers, and others. The center of the impact area is in a cove with 30-40 foot coastal bluffs. Immediately north of the launch site is a popular day use beach area. On a clear summer day, the beach may support up to 500 visitors at any given time. Surfing activity is common immediately north of the site. During the period from sunset through the duration of the fireworks display, 10-20 vessels anchor within the impact area to view the fireworks. A U. S. Coast Guard vessel motors through the impact area to maintain a safety zone seaward of the launch site.

Marine Mammals – The largest concentration of wildlife near the Monterey impact area are California sea lions and marine birds resting at the Monterey breakwater approximately 700 yards northwest of the center of the impact area. Within the Monterey Bay area, depending on time of year, specific launch site, and local environmental factors, MBNMS has estimated that an average of 0-700 sea lions (150-1500 maximum) and an average of 7-50 harbor seals (60-100 maximum) may be present during a fireworks display. Several sea otters are present within Monterey Harbor and the impact area during the time of the fireworks display. Otters outside the harbor are most concentrated to the northwest of the Monterey breakwater, however, otters routinely forage and loiter within the impact area and along the shoreline to the north.

Sea otters and pups routinely forage and loiter within the Pacific Grove impact area in moderate numbers. Harbor seals routinely use offshore rocks and wash rocks for haulout and also forage in the area.

Other Marine Wildlife - Non-breeding California brown pelicans appear in greatest number in central California during the late summer and fall. Within the Monterey harbor area, pelicans roost on the Monterey breakwater; on wharfs, piers, and structures; on exposed rocks in the harbor; and on the barge used to launch pyrotechnics during the fireworks display. The southernmost documented plover nest site (no longer active) near east Monterey was located approximately 1000 yards north of the launch site. The public beaches where spectators gather for City fireworks displays are routinely groomed by municipal public works department staff

and frequented daily by beachgoers and their domestic pets. These beaches are high human use areas, and therefore, do not present optimal nesting habitat. The likelihood of successful nesting and nest survival in these high-use beach areas is low. The greatest nesting density for snowy plover in the local region is centered 6-10 statute miles to the north.

Individual cormorants and gulls often roost on offshore rocks adjacent to the Pacific Grove launch site, but there are no large concentrations of marine birds due to the high volume of human activity and lack of significant roosting habitat. A small roost site exists at Point Cabrillo, approximately 3/4 miles southeast of the launch site, and hosts aggregations of gulls, cormorants, pelicans, and other marine birds. Extensive kelp beds cover much of the impact area. The Hopkins Marine Reserve boundary is approximately 1/2 statute mile southeast of the launch site.

4. Cambria

Site Description – The site has been used annually for a small Independence Day fireworks display on July 4, which lasts approximately 20 minutes. The launch site is on a sandy beach at Shamel County Park, and the aerial shells are aimed to the west. Immediately north of the launch site is the mouth of Santa Rosa Creek and Lagoon. The marine venue is preferred for optimal public access and to avoid the fire hazard associated with terrestrial display sites. The fireworks display occurs at the height of the dry season in central California, when area vegetation is particularly prone to ignition from sparks or embers.

Human Use Patterns – The impact area is immediately adjacent to a county park and recreational beach. The impact area is used by boaters, recreational fishermen, swimmers, surfers, and beachgoers. The shoreline south of the launch site is lined with hotels, abuts a residential neighborhood, and is part of San Simeon State Beach.

Marine Mammals – The impact area includes low concentrations of harbor seals. Sea otters and sea lions are present in the impact area in moderate numbers. Within the Cambria area, depending on time of year, specific launch site, and local environmental factors, MBNMS has estimated that an average of 0 sea lions (25-50 maximum) and an average of 20 harbor seals (60 maximum) may be present during a fireworks display. It is possible that individual elephant seals may enter the area from breeding sites to the north at Point Piedras Blancas, but breeding occurs in the winter and displays at Cambria are limited to the summer. Gray whales migrate along the coast in this area and may pass through the impact area, but July is not peak gray whale migration period.

Other Marine Wildlife - Immediately north of the launch site is the mouth of Santa Rosa Creek and Lagoon. Gulls, shorebirds, and waterfowl are commonly found in the lagoon. Snowy plover habitat is located 1 1/2 miles to the north of the launch site.

B. Marine Mammals Potentially Found in the Area

Twenty-six species of marine mammals have been observed in the Monterey Bay area, including five species of the sub-order pinnipeds (seals and sea lions), one species from the sub-order fissipeds (sea otter), and twenty species of the order cetaceans (whales and dolphins). Of these, the species of marine mammals that are likely to be present in any of the four fireworks display impact zones at the time of fireworks displays include the California sea lion *(Zalophuus californianus)*, Pacific harbor seal *(Phoca vitulina richardsi)*, bottlenose dolphin *(Tursiops truncatus)*, harbor porpoise *(Phocena phocena)*, California gray whale *(Eschrichtius robustus)*, and Southern sea otters *(Enhydra lutris neries)*. One additional species that would be found only rarely within fireworks impact zones at the time of display is the northern elephant seal *(Mirounga angustirostris)*. General information on these species can be found in Folkens' *Guide to the Marine Mammals of the World* (2002). Information relevant to the distribution, abundance and behavior of the species that are most likely to be impacted by fireworks displays within the MBNMS is provided below. Additional information regarding these species may be found the FR Notice for the IHA (68 FR 28810, May 27, 2003) and in the NMFS stock assessments on the NMFS website: http://www.nmfs.noaa.gov/pr/PR2/Stock_Assessment_Program/individual_sars.html. Relevant information from these sources on these species is incorporated by reference.

1. California Sea Lions *(Zalophuus californianus)*

The population of California sea lions ranges from southern Mexico to southwestern Canada (Caretta et al., 2004). In the U.S., they breed during July after pupping in late May to June, primarily in the Channel Islands of California. Most individuals of this species breed on the Channel Islands off southern California (100 miles south of the MBNMS) and off Baja and mainland Mexico (Odell 1981), although a few pups have been born on Año Nuevo Island (Keith et al., 1984). Following the breeding season on the Channel Islands, most adult and sub-adult males migrate northward to central and northern California and to the Pacific Northwest, while most females and young animals either remain on or near the breeding grounds throughout the year or move southward or northward, as far as Monterey Bay.

Since nearing extinction in the early 1900's, the California sea lion population has increased and is now robust and growing at a current rate of 5.4 to 6.1 percent per year (based on pup counts) with an estimated "minimum" population (U.S. West Coast) of 138,881 animals. Actual population level may be as high as 237,000 to 244,000 animals. The population is not listed as "endangered" or "threatened" under the Endangered Species Act (ESA); nor is this species designated as "depleted" or classified as a "strategic stock" under the MMPA.

In any season, California sea lions are the most abundant pinniped in the area (Bonnell et al., 1983), primarily using the central California area to feed during the non-breeding season. After breeding farther south along the coast and migrating northward, populations peak in the Monterey Bay area in fall and winter and are at their lowest numbers in spring and early summer. A minimum of 12,000 California sea lions is probably present at any given time in the MBNMS

region. Año Nuevo Island is the largest single haul-out site in the Sanctuary, hosting as many as 9,000 California sea lions at times (Weise, 2000 and Lowry, 2001).

2. Harbor Seal *(Phoca vitulina richardsi)*

Harbor seals are distributed throughout the west coast of the U.S., inhabiting near-shore coastal and estuarine areas from Baja California, Mexico, to the Pribilof Islands in Alaska. They generally do not migrate, but have been known to travel extensive distances to find food or suitable breeding areas (Caretta et al., 2004). In California, approximately 400-500 harbor seal haulout sites are widely distributed along the mainland and on offshore islands (Caretta et al., 2004).

The harbor seal population in California is healthy and growing at a current rate of 3.5 percent per year with an estimated "minimum" population (California) of 25,720 animals (Caretta et al., 2004). The California population is estimated at 27,863 animals. The population is not listed as "endangered" or "threatened" under the ESA; nor is this species designated as "depleted" or classified as a "strategic stock" under the MMPA.

Harbor seals are residents in the MBNMS throughout the year, occurring mainly near the coast. They haul out at dozens of sites along the coast from Point Sur to Año Nuevo. Within MBNMS, tagged harbor seals have been documented to move substantial distances (10-20 km) to foraging areas each night (Oxman 1995, Trumble 1995). The species does breed in the Sanctuary, and pupping within the Sanctuary occurs primarily during March and April followed by a molt during May and June. Peak abundance on land within the Sanctuary is reached in late spring and early summer when they haul out to breed, give birth to pups, and molt (MBNMS Final Environmental Impact Statement (FEIS), 1992).

3. Southern Sea Otters *(Enhydra lutris nereis)*

The southern sea otter population presently contains about 2,150 animals, and can be found along the coast of central and southern California from Half Moon Bay to Point Conception (USFWS, 2003). They can be found throughout the shallow waters of Monterey Bay from Pismo Beach to Año Nuevo Island. Approximately 31 percent of this population is currently found in the area from Point Sur north to Año Nuevo/Pigeon Point. Southern sea otters breed and give birth year round, however the seasonality is not highly synchronous and the birth peak may extend over several months.

Range-wide population counts declined at a rate of approximately 5 percent per year between 1995 and 1999, although the population's range expanded both to the north and the south. The current population status is less certain, with recent counts being relatively stable (USFWS, 2003). The southern sea otter is listed as "threatened" under the ESA, and is therefore also designated as "depleted" under the MMPA. Take of southern sea otters is regulated by the USFWS.

Within the MBNMS, sea otters inhabit a narrow zone of coastal waters, normally staying within one mile from shore (MBNMS FEIS, 1992). They forage in both rocky and soft-sediment communities as well as in the kelp understory and canopy. They seldom are found in open waters deeper than 30 m, preferring instead the kelp beds, which serve as vital resting, foraging, and nursery sites. An official state-designated Sea Otter Game Refuge extends from Carmel south to Santa Rosa Creek near Cambria, encompassing about half the otter's established range.

4. California Gray Whale *(Eschrichtius robustus)*

The latest abundance estimate is 26,635, based on counts made during the 1997/1998 southbound migration; however, the population size of this species has increased slightly over the past few decades (Caretta et al., 2002). Because of these increases, in 1994 the gray whale was de-listed from its "endangered" under the ESA, and was also undesignated as "depleted" under the MMPA.

Gray whales are seasonal migrants, traveling close to shore, and are the object of most of the whale watching in the area. They pass through the area of the Sanctuary twice during their yearly migrations. The peak northward migration of male gray whales occurs in mid-March, followed two months later by the second migration wave, which is composed of cows and calves. These whales migrate from wintering grounds in Baja California, Mexico, northward to Alaska. The southbound migration occurs in late December and January, from their breeding grounds in the north back down to the south. The species does not breed in the Sanctuary.

No California gray whales have ever been sighted in fireworks impact areas during displays. Display locations within Monterey Bay are not immediately adjacent to the prime coastal migration route, since most gray whales bypass the inner shorelines of the bay, instead transiting between Point Piños and Point Santa Cruz. Likewise, the Half Moon Bay display occurs east of the natural reef barrier between the migration route and the shoreline. The only remaining display site that might impact gray whales is at Cambria, but the current display authorized for the area occurs in July, outside of the prime migration seasons.

5. Bottlenose dolphin *(Tursiops truncatus)*

Bottlenose dolphins are distributed world-wide in tropical and warm-temperate waters, including California where separate coastal and offshore populations are known to exist (Caretta et al., 2004). Relative to the location of the MBNMS, California coastal bottlenose dolphins are found within about 1 kilometer of shore primarily from Point Conception south into Mexican waters. Bottlenose dolphins are found in small numbers (12-18) within the bay seemingly on a year-round basis (MBNMS FEIS, 1992). The best current estimate of the average number of coastal bottlenose dolphins from this stock in this area is 206 animals (Caretta et al., 2004). This species is not listed under the ESA or listed as depleted under the MMPA.

6. Harbor porpoise *(Phocena phocena)*

In the Pacific Ocean, harbor porpoises are found in coastal and inland waters from Point Conception, CA to Alaska and across the Pacific to Kamchatka and Japan (Barlow et al., 1995, Gaskin 1984). This species appears to have more restricted movements along the west coast of the continental U.S. than along the eastern coast. Harbor porpoises prefer shallow waters, and can usually be found over sandy bottoms just off the surf in the north central part of the bay.

Based on aerial surveys from 1997-1999 under good survey conditions, the estimate of abundance for the Monterey Bay stock of this species is 1,603 animals with a minimum abundance estimate of 1,143 animals (Caretta et al., 2002). Population growth has not been measured for any harbor porpoise population (Caretta et al., 2002). This species is not listed under the ESA or listed as depleted under the MMPA.

7. Northern elephant seal *(Mirounga angustirostris)*

Northern elephant seals breed and give birth in California (U.S.) and Baja California (Mexico), primarily on offshore islands (Stewart et al.,1994), in the winter months from December to March (Stewart and Huber, 1993). They then disperse to feed in pelagic waters throughout the eastern North Pacific. Adults return to land between March and August to molt, with males returning later than females (Caretta et al., 2002).

Elephant seals nearly became extinct in the past century, but have undergone a remarkable sustained population growth, and colonies continue to grow. Based on an estimated 28,845 pups born in California in 2001, the California stock was estimated to be 101,000 in 2001, while the minimum population size was estimated conservatively to be 60,547 Caretta et al., 2004). They are not listed under the ESA or listed as depleted under the MMPA.

Peak abundances on land within the MBNMS occur in the spring when juvenile males and females haulout to molt. The breeding population at these locations presently numbers about 3,500 animals, and the spring population on land exceeds 4,000 animals (MBNMS FEIS, 1992). The largest populations are on Año Nuevo Island and the adjacent mainland point. Estimates based on population structure indicate that elephant seals of the Año Nuevo colony account for about 4% of the entire world population of this species (MBNMS FEIS, 1992). The elephant seal would only rarely be found within the fireworks areas of the MBNMS.

C. Other Protected Marine Wildlife Potentially Found in the Area

1. Brown Pelican (*Pelecanus occidentalis*)

The brown pelican was federally listed as endangered in 1970 (35 *Federal Register* 16047). The recovery plan for the brown pelican describes the biology, reasons for decline, and actions needed for recovery of the species (USFWS, 1983). Critical habitat for the brown pelican has not been designated.

The California brown pelican is one of six recognized subspecies of the brown pelican. The brown pelican is a large bird recognized by the long, pouched bill that is used to catch surface-schooling fishes. The California brown pelican weighs up to ten pounds and has a wingspan of up to eight feet.

The brown pelican is a conspicuous resident along the coasts of California and Baja California. Brown pelicans nest in colonies on small coastal islands that are free of mammalian predators and human disturbance. They are associated with an adequate and consistent food supply and areas with appropriate roosting sites for both resident and migrant pelicans (USFWS 1983). During the non-breeding season, brown pelicans roost communally in areas that are near adequate food supplies, have some type of physical barrier to predation and disturbance, and that provide some protection from environmental stresses such as wind and high surf. Offshore rocks, breakwaters, and jetties are often used for roosting.

The breeding distribution of the California brown pelican ranges from the Channel Islands of southern California southward to the islands off Nayarit, Mexico. When not breeding, pelicans may range as far north as Vancouver Island, British Columbia, Canada, and south to Colima, Mexico. The maximum breeding population of the California brown pelican throughout its range may number about 55,000 to 60,000 pairs. The largest breeding group is located on the Gulf of California, comprising approximately 68 percent of the total breeding population. Only two breeding colonies exist in the United States. These are located on Anacapa and Santa Barbara Islands. In the past, breeding occurred as far north as Point Lobos near Monterey.

Brown pelicans are seasonally present at all general fireworks display locations within the MBNMS and react to fireworks in the same general manner as other marine birds. Pelicans do not nest or breed in the Sanctuary.

2. Western Snowy Plover (*Charadrius alexandrinus nivosus*)

The Pacific coast population of the western snowy plover was federally listed as threatened on March 5, 1993 (58 *Federal Register* 12864). A draft recovery plan for the western snowy plover has been completed (USFWS, 2001).

Critical habitat for this taxa was designated for 28 units along the coasts of Washington, Oregon, and California on December 7, 1999 (64 *Federal Register* 68508). The primary constituent elements for western snowy plover critical habitat include space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. The primary constituent elements are found in areas that support or have the potential to support intertidal beaches (between mean low water and mean high tide), associated dune systems, and river estuaries. Important components of the beach/dune/estuarine ecosystem include surf-cast kelp, sparsely vegetated foredunes (beach area immediately in front of a sand dune), interdunal flats (flat land between dunes), spits, washover areas, blowouts (a hole or cut in a dune caused by storm action), intertidal flats (flat

land between low and high tides), salt flats, flat rocky outcrops, and gravel bars. Several of these components (sparse vegetation, salt flats) are mimicked in artificial habitat types used less commonly by snowy plovers (*i.e.*, dredge spoil sites and salt ponds and adjoining levees).

The western snowy plover is one of 12 subspecies of the snowy plover (*Charadrius alexandrinus*). The species occurs within the family Charadriidae. The western snowy plover is a small, pale-colored shorebird with dark patches on either side of the upper breast.

Western snowy plovers prefer coastal beaches that are relatively free from human disturbance and predation. Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the preferred habitats for nesting plovers. Several of these components (*e.g.*, sparse vegetation, salt flats) are mimicked in artificial habitat types used less commonly by western snowy plovers.

Western snowy plovers tend to be gregarious during the winter months. Western snowy plovers are primarily visual foragers, feeding on invertebrates in the wet sand and surf-cast kelp within the intertidal zone, in dry, sandy areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons.

The Pacific coast population of the western snowy plover breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico. Historically, western snowy plovers bred or wintered at 157 locations on the Pacific coast, including 133 sites in California. Larger numbers of birds are found in southern and central California, in Monterey Bay (estimated 200 to 250 breeding adults), Morro Bay (estimated 85 to 93 breeding adults), Pismo Beach to Point Sal (estimated 130 to 246 breeding adults), Vandenberg Air Force Base (estimated 130 to 240 breeding adults), and the Oxnard Lowland (estimated 69 to105 breeding adults).

During the non-breeding season, western snowy plovers may remain at breeding sites or may migrate to other locations. Most winter south of Bodega Bay, California. Many birds from the interior population winter on the central and southern coast of California.

Western snowy plovers bred at 53 coastal locations in California prior to 1970. Between 1970 and 1981, western snowy plovers stopped breeding in parts of San Diego, Ventura, and Santa Barbara counties, most of Orange County, and all of Los Angeles County (Page and Stenzel 1981). By 1991, 78 percent of the remaining breeding population in coastal California nested at only eight sites: San Francisco Bay, Monterey Bay, Morro Bay, Callendar-Mussel Rock dunes area, the Point Sal to Point Conception area (Vandenberg Air Force Base), Oxnard lowlands, Santa Rosa Island, and San Nicolas Island (Page et al., 1991).

Five critical habitat units for the Pacific coast population of the western snowy plover have been designated within the area where fireworks events may be authorized. Some of these units are subdivided into one or more subunits. These areas include the Half Moon Bay Beaches (one subunit), the Santa Cruz Coast Beaches (four subunits), Monterey Beaches (five subunits), Point Sur Beach (one subunit), and Arroyo Hondo Creek Beach (one subunit).

3. Other Marine Birds

Cormorants and gulls commonly forage, roost, and nest near most fireworks launch sites. These species are common throughout the MBNMS and nest in the spring and early summer months on piles, dolphins, piers, buildings, and coastal rocks and structures. Their population numbers are healthy and growing, and birds inhabiting urban areas have adapted to increased noise levels caused by various human activities.

Other marine birds occasionally found near fireworks sites on a seasonal basis are sooty shearwaters, western grebes, common loons and surf scoters. None of these birds nest within the MBNMS nor roost onshore. All enter the Sanctuary to forage during non-breeding seasons. Loons, grebes, and scoters appear in the Sanctuary in modest numbers during late fall and winter months. Shearwaters are true pelagic seabirds that appear throughout the Sanctuary in large aggregations totaling tens of thousands from spring until early fall.

The USFWS has determined that the protected marine bird species marbled murrelet, California condor, California clapper rail, California least tern do not occur in assigned fireworks display areas and are thus not likely to be impacted by authorized fireworks activity.

VI. ENVIRONMENTAL CONSEQUENCES

A. Issuance of LOAs and Sanctuary Authorizations For 20 Fireworks Displays (Preferred Alternative)

1. Potential Direct Effects on Marine Mammals and Other Sanctuary Resources – Sound and Light

Marine mammals can be impacted by fireworks displays in three ways: light, sound, and debris. The primary causes of disturbance are light flashes and sound effects from exploding fireworks. Pyrotechnic devices that operate at higher altitudes are more likely to have a larger impact area (such as aerial shells), while ground and low-level devices have more confined effects. The impact area is defined as the area where sound, light, and debris effects have direct impacts on marine organisms and habitats. Direct impacts include, but are not limited to, immediate physical and physiological impacts such as abrupt changes in behavior, flight response, diving, evading, flushing, cessation of feeding, and physical impairment or mortality.

The largest commercial aerial shells used within the Sanctuary are 10-12 inches in diameter and reach a maximum altitude of 1000 feet AGL. The bursting radius of the largest shells is approximately 850 feet. The impact area can extend from 1 to 2 statute miles from the center of the detonation point depending on the size of the shell, height of the explosions, type of explosions, wind direction, atmospheric conditions, and local topography.

Aerial shells produce flashes of light that can be brilliant (exceeding 30,000 candela[8]) and can occur in rapid succession. Loud explosive and crackling sound effects stem primarily from salutes (described earlier) and bursting charges at altitude. People and wildlife on the ground

and on the surface of the water can feel the sound waves and the accompanying rapid shift of ambient atmospheric pressure. This pressure wave has been known to activate car alarms that detect vibration. Sounds attenuate farther from high altitude shells than low altitude shells since they are not as easily masked by buildings and landforms, allowing the sound envelope to ensonify more surface area on the ground and water. The sound from the lifting charge detonation is vectored upward through the mortar tube opening and reports as a dull thump to bystanders on the ground, far less conspicuous than the high-level aerial bursts. The intensity of an aerial show can be amplified by increasing the number of shells used, the pace of the barrage, and the length of the display.

Low-level devices reach a maximum altitude of 200 feet AGL. The impact area can extend to 1 statute mile from the center of the ignition point depending on the size and flight patterns of projectiles, maximum altitude of projectiles, the type of special effects, wind direction, atmospheric conditions, and local structures and topography. Low-level devices also produce brilliant flashes and fountains of light and sparks accompanied by small explosions, popping, and crackling sounds. Since they are lower in altitude than aerial shells, sound and light effects impact a smaller area. Low-level devices do not typically employ large black powder charges like aerial shells, but are often used in large numbers in concert with one another and in rapid succession, producing very intense localized effects.

Set Pieces are stationary, do not launch any encased effects into the air, and produce effects between 0 and 50 ft AGL. Small pellets of a pyrotechnic composition, such as those from sparklers or roman candles may be expelled a short distance into the air. Loud, but not explosive, noises, such as crackling, popping, or whistling may emanate from a set piece, though they are usually used in concert with low-level effects and aerial displays. Depending on the size and height of the structure, the number and type of effects, wind direction, and local topography, the impact area can extend up to 0.5 mile from the center of the ignition point, though fallout is generally confined within a 100 yard radius. Residue may include smoke, airborne particulates, fine solids, and slag.

The primary impact to wildlife noted in past observation reports by Sanctuary staff is the disturbance of marine mammals and seabirds from the light and sound effects of the exploding aerial shells. The loud sound bursts and pressure waves created by the exploding shells appear to cause more wildlife disturbance than the illumination effects. In particular, the percussive aerial salute shells have been observed to elicit a strong flight response in California sea lions and marine birds in the vicinity of the impact area (within 800 yards of the launch site).

a. Physical Impairment

In 2001, the MBNMS and USFWS monitored the July 4 City of Monterey fireworks display with the most thorough effort to date. Monitors recorded species abundance before, during, and after the event and measured the decibel level of exploding fireworks. A hand-held decibel meter was located aboard a vessel adjacent to the Monterey Breakwater, approximately one half mile from the fireworks launch site. The highest sound pressure level (SPL) reading observed on the decibel meter during the fireworks display (which did not include aerial salutes)

was 82 decibels. In the Vandenberg Air Force Base (VAFB) studies (described in sub-section b. below), some harbor seals remained at their haul-out during a space rocket launch until the sound exposure level (SEL) was 100 decibels or above (which, in the case of the VAFB launch locations and durations, is equivalent to an SPL of 89 to 95 decibels), and only short-term effects were detected. The typical decibel levels for the display ranged from 70 to 78 decibels, and no salute effects were used in the display. An ambient noise level of 58 decibels was recorded at the survey site 30 minutes following the conclusion of the fireworks. The final regulations for incidental take of marine mammals during fireworks displays include an acoustic monitoring requirement to measure sound levels at the Monterey Breakwater (where sea lions typically haul out) during the 2006 City of Monterey Fourth of July fireworks display (which will include aerial salutes).

Permanent (auditory) threshold shift (PTS) occurs when there is physical damage to the sound receptors in the ear. In some cases there can be total or partial deafness, while in other cases the animal has an impaired ability to hear sounds in specific frequency ranges. Although there is no specific evidence that exposure to fireworks can cause PTS in any marine mammals, physical damage to a mammal's ears can potentially occur if it is exposed to sound impulses that have very high peak pressures, especially if they have very short rise times (time required for sound pulse to reach peak pressure from the baseline pressure). Such damage can result in a permanent decrease in functional sensitivity of the hearing system at some or all frequencies.

Temporary (auditory) threshold shift (TTS) is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter, 1985). When an animal experiences TTS, its hearing threshold rises and a sound must be stronger in order to be heard. TTS can last from minutes or hours to (in cases of strong TTS) days. Richardson et al. (1995) note that the magnitude of TTS depends on the level and duration of noise exposure, among other considerations. For sound exposures at or somewhat above the TTS threshold, hearing sensitivity recovers rapidly after exposure to the noise ends.

Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very strong sounds, but there has been no specific documentation of this for marine mammals exposed to fireworks. Based on current information, NMFS precautionarily sets impulsive sounds equal to or greater than 190 dB re 1 microPa (rms) as the exposure thresholds for onset of Level A harassment (injury or mortality) for pinnipeds, *in water* (NMFS, 2000). If measured by an inanimate receiver 190 dB re 1 microPa (rms) would equal an A-weighted sound intensity level of 128 dB re 20 microPa, which are the units used for airborne sound. However, environmental conditions and the ear of the receiving animal may alter how the sound is received in air versus water, and precise exposure thresholds for airborne sounds have not been agreed upon.

Some factors that contribute to onset of PTS are as follows: (1) exposure to single very intense noises, (2) repetitive exposure to intense sounds that individually cause TTS but not PTS, and (3) recurrent ear infections or (in captive animals) exposure to certain drugs.

Given the frequency, duration, and intensity of sounds (maximum measured 82 dB for larger aerial shells) that marine mammals may be exposed to, it is unlikely that they would sustain temporary, much less permanent, hearing impairment during fireworks displays.

In order to determine if harbor seals experience any change in their hearing sensitivity as a result of launch noise, researchers at VAFB conducted Auditory Brainstem Response (ABR) testing on 10 harbor seals prior to, and after, the launches of 3 Titan IV rockets (one of the loudest launch vehicles at the south VAFB haul-out site). Detailed analysis of the changes in waveform latency and waveform replication of the ABR measurements showed that there were no detectable changes in the seals' hearing sensitivity as a result of the launch noise, which ranged from an A-weighted SPL Lmax of 111.4 to 111.2 dB and an A-weighted SEL from 96.6 to 103.6 (SEL is an energy metric that takes duration of the sound into account, and since the rocket sounds last more than one second, SEL is higher than SPL) (SRS Technologies, 2001).

b. Behavioral Response

In some display locations, marine mammals and other wildlife may avoid or temporarily depart the impact area during the hours immediately prior to the beginning of the fireworks display due to increased human recreational activities associated with the overall celebration event (noise, boating, kayaking, fishing, diving, swimming, surfing, picnicking, beach combing, tidepooling, etc.), and as a fireworks presentation progresses, most marine mammals and birds generally evacuate the impact area. In particular, a flotilla of recreational and commercial boats usually gathers in a semi circle within the impact area to view the fireworks display from the water. From sunset until the start of the display, security vessels of the U.S. Coast Guard and/or other government agencies often patrol throughout the waters of the impact area to keep vessels a safe distance from the launch site.

Non-nesting marine birds (especially pelicans, cormorants, and gulls) are among the first wildlife to evacuate the area at the start of fireworks displays. Past observations by the MBNMS indicate that virtually all birds within the impact area depart in a burst of flight within one minute of the start of a fireworks display, including low-level displays. However, staff have also repeatedly observed that Brandt's cormorants nesting at the Monterey Breakwater remain on their nests (over 200 nests) throughout the large July 4th aerial display that is launched each year from a barge approximately 900 yards away. Most non-nesting marine birds on the breakwater evacuate the area until the conclusion of the display. Their numbers return to normal levels by the following morning. During a 1998 display in Monterey, MBNMS staff observed a marine bird swim within 70 yards of the launch site during the fireworks display. The bird remained on the water as the pyrotechnic effects were ignited aboard the barge and made no effort to swim away from the launch site. No injuries, fatalities, or negative impacts to marine birds have been detected during several years of monitoring and observations by the MBNMS.

Sea lions have been observed evacuating haul-out areas upon initial detonation of fireworks, and then returning to the haul-out sites within 4 to 15 hours following the end of the fireworks display. Harbor seals have been seen to remain in the water after initial fireworks detonation around the haul-out site. Sea lions in general are more tolerant of noise and visual

disturbances than harbor seals - adult sea lions have likely habituated to many sources of disturbance and are therefore much more tolerant to nearby human activities. For both pinniped species, pups and juveniles are more likely to be harassed when exposed to disturbance than older animals. In general, marine wildlife depart or avoid surface waters and haul-out sites within a 1000-yard radius of the center of the impact area during fireworks displays. Even short, low-level displays can cause a flight response in wildlife within the impact area (fireworks report).

NMFS and MBNMS found no peer-reviewed literature that specifically investigates the response of California sea lions and harbor seals to commercial fireworks displays. Similarly, general harassment or injury thresholds for exposure to airborne sounds have not been set. However, extensive studies have been conducted at VAFB to determine responses by California pinnipeds to the effects of periodic rocket launches, the light and sound effects of which would be roughly similar to the effects of pyrotechnic displays, but of greater intensity. This ongoing scientific research program has been conducted since 1997 to determine the long-term cumulative impacts of space vehicle launches on the haul-out behavior, population dynamics and hearing acuity of harbor seals at VAFB. In addition, when prediction models projected that a sonic boom from the rocket launches would hit one of the northern Channel Islands, pinniped populations were studied at identified haul-out sites in order to determine the impact of the sound wave on pinniped behavior.

The response of harbor seals to rocket launch noise at VAFB depended on the intensity of the noise (dependent on the size of the vehicle and its proximity) and the age of the seal (SRS Technologies 2001). Not surprisingly, the highest noise levels are typically from launch vehicles with launch pads closest to the haul-out sites. The percentage of seals leaving the haul-out increases with noise level up to approximately 100 decibels (dB) A-weighted SEL, after which almost all seals leave, although recent data has shown that an increasing percentage of seals have remained on shore, and those that remain are adults. Given the high degree of site fidelity among harbor seals, it is likely that those seals that remained on the haul-out site during rocket launches had previously been exposed to launches; that is, it is possible that adult seals have become acclimated to the launch noise and react differently than the younger inexperienced seals. Of the 20 seals tagged at VAFB, 8 (40 percent) were exposed to at least 1 launch disturbance but continued to return to the same haul-out site. Three of those seals were exposed to 2 or more launch disturbances. Most of the seals exposed to launch noise (n=6, 75 percent) appeared to remain in the water adjacent to the haul-out site and then returned to shore within 2 to 22 minutes after the launch disturbance. Of the 2 remaining seals that left the haul-out after the launch disturbance, both had been on shore for at least 6 hours and returned to the haul-out site on the following day (SRS Technologies 2001).

The launches at VAFB do not appear to have had long-term effects on the harbor seal population in this area. The total population of harbor seals at VAFB is estimated to be 1,040 animals and has been increasing at an annual rate of 12.6 percent. Since 1997, there have been 5 to 7 space vehicle launches per year and there appears to be only short-term disturbance effects to harbor seals as a result of launch noise (SRS Technologies, 2001). Harbor seals will

temporarily leave their haul-out when exposed to launch noise; however they generally return to the haul-out within one hour.

On San Miguel Island, when California sea lions and elephant seals were exposed to sonic booms from vehicles launched on VAFB, sea lion pups were observed to enter the water, but usually remained playing in the water for a considerable period of time. Some adults approached the water, while elephant seals showed little to no reaction. This short-term disturbance to sea lion pups does not appear to have caused any long-term effects to the population.

The conclusions of the five-year VAFB study are almost identical to the MBNMS observations of pinniped response to commercial fireworks displays. Observed impacts have been limited to short-term disturbance only and NMFS believes that the fireworks activities would have a negligible impact on the affected pinniped species and stocks.

c. Sea Otters

Past Sanctuary observations have not detected any disturbance to California sea otters as a result of the fireworks displays; however, past observations have not included specific surveys for this species. Sea otters do frequent all general display areas. Sea otters and other species may temporarily depart the area prior to the beginning of the fireworks display due to increased human activities.

Some sea otters in Monterey harbor have become quite acclimated to very intense human activity, often continuing to feed undisturbed as boats pass simultaneously on either side and within 20 feet of the otters. It is therefore possible that select individual otters may have a higher tolerance level than others to fireworks displays. Otters in residence within the Monterey harbor display a greater tolerance for intensive human activity than their counterparts in more remote locations.

The USFWS is responsible for regulating the take of southern sea otters. The USFWS issued a biological opinion on June 22, 2005, which concluded that the authorization of fireworks displays, as proposed in the preferred alternative, is not likely to jeopardize the continued existence of endangered and threatened species within the Sanctuary or to destroy or adversely modify any listed critical habitat. The USFWS further found that MBNMS would be unlikely to take any southern sea otters, and therefore issued neither an incidental take statement under the ESA nor an IHA. Further information may be found in the USFWS' Biological Opinion for the Authorization of Fireworks Displays Within the Monterey Bay National Marine Sanctuary, San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties, California (1-8-02-F-33).

d. Cetaceans

Though the aforementioned species are known to frequent nearshore areas within the Sanctuary, they have never been reported in the vicinity of a fireworks display, nor have there

been any reports to the MBNMS of strandings or injured/dead animals discovered after any display. Since sound does not transmit well between air and water, these animals would likely not encounter the effects of fireworks except when surfacing for air. NMFS does not anticipate any impacts to cetaceans and they are not addressed further in this document.

e. Pinnipeds

The northern elephant seal is seen infrequently in the areas with fireworks displays and NMFS believes that they are not likely to be impacted by fireworks displays. Therefore, the only pinniped species likely to be harassed by the fireworks displays, and further addressed in this document, are the California sea lion and the Pacific harbor seal.

Past monitoring by the MBNMS has identified only a short-term harassment of animals by fireworks displays, with the primary causes of disturbance being sound effects and light flashes from exploding fireworks. Additionally, the VAFB study of the effects of rocket-launch noise, which is more intense than fireworks noise, on California sea lions and Pacific harbor seals indicated only short-term behavioral impacts. With the mitigation measures proposed below, takes will be limited to the temporary incidental harassment of California sea lions and Pacific harbor seals due to evacuation of usual and accustomed haul-out sites for as little as 15 minutes and as much as 15 hours following any fireworks event. Most animals depart affected haul-out areas at the beginning of the display and return to previous levels of abundance within 4 to 15 hours following the event. This information is based on observations made by Sanctuary staff over an eight-year period (1993-2001) and a quantitative survey made in 2001. Empirical observations have focused on impacts to water quality and selected marine mammals and birds in the vicinity of the displays. No observations were made in upland areas (beyond the jurisdiction of the Sanctuary) due to limited staff resources.

California Sea Lions

Sea lions in general are more tolerant to noise and visual disturbances than harbor seals. In addition, pups and juveniles are more likely to be harassed when exposed to disturbance than the older animals. Adult sea lions have likely habituated to many sources of disturbance and are therefore much more tolerant of human activities nearby. Of all the display sites in the Sanctuary, California sea lions are only present in significant concentrations at Monterey. The following is an excerpt from a 1998 MBNMS staff report on the reaction of sea lions to a large aerial fireworks display in Monterey:

> In the first seconds of the display, the sea lion colony becomes very quiet, vocalizations cease, and younger sea lions and all marine birds evacuate the breakwater. The departing sea lions swim quickly toward the open sea. Most of the colony remains intact until the older bulls evacuate, usually after a salvo of overhead bursts in short succession. Once the bulls depart, the entire colony follows suit, swimming rapidly in large groups toward the open sea. A select few of the largest bulls may sometimes remain on the breakwater. Sea lions have

been observed attempting to haul out onto the breakwater during the fireworks display, but most are frightened away by the continuing aerial bursts.

Sea lions begin returning to the breakwater within 30 minutes following the conclusion of the display but have been observed to remain quiet for some time. The colony usually reestablishes itself on the breakwater within 2-3 hours following the conclusion of the display, during which vocalization activity returns. Typically, the older bulls are the first to renew vocalization behavior (within the first hour), followed by the younger animals. By the next morning, the entire colony seems to be intact and functioning with no visible sign of abnormal behavior.

In the 2001 Monterey survey (discussed earlier), most animals were observed to evacuate haul-out areas upon the initial report from detonated fireworks. Surveys continued for 4.5 hours after the initial disturbance and numbers of returning California sea lions remained at less than 1% of pre-fireworks numbers. When surveys resumed the next morning (13 hours after the initial disturbance), sea lion numbers on the breakwater equaled or exceeded pre-fireworks levels. MBNMS staff have been opportunistically monitoring sea lions at the City of Monterey's Fouth of July celebration for more than 10 years. The following is a summary of their general observations: sea lions begin leaving the breakwater as soon as the fireworks begin, evacuate completely after an aerial salute or quick succession of loud effects, usually begin returning within a few hours of the end of the display, and are present on the breakwater at pre-firework numbers by the following morning.

Pacific Harbor Seals

Up to 15 harbor seals may typically be present on rocks in the outer Monterey harbor in early July. The seal haulout area is approximately 2,100 ft (640 m horizontal distance) from the impact zone for the aerial pyrotechnic display. Only two harbor seals were observed on and near the rocks adjacent to Fisherman's Wharf prior to the 2001 display. Neither were observed to haul out after the initial fireworks detonation, but remained in the water around the haul-out. The haul-out site was only surveyed until the conclusion of the fireworks display, therefore, no animal return data is available. However, the behavior of the seals after the initial disturbance and during the fireworks display is similar to the response behavior of seals during the VAFB rocket launches, where they loitered in the water adjacent to their haul-out site during the launch and returned to shore within 2 to 22 minutes after the launch disturbance.

MBNMS staff monitored harbor seal reactions to a coastal fireworks display at Aptos in October 2000. The staff report made the following finding:

Harbor seals could not be seen during and immediately after the event. It's likely, based on the reaction of the birds and the noise of the display, that the seals evacuated the area on and around the cement ship. Harbor seals were sighted hauled out on the ship and in the water the following morning.

A private environmental consultant has monitored the Aptos fireworks display each October from 2001 through 2005 (per California Coastal Commission permit conditions) and concluded that harbor seal activity returns to normal at the site by the day following the display. Surveys have detected no evidence of injury or mortality in harbor seals as a result of the annual 30-minute fireworks display at the site.

Since harbor seals have a smaller profile than sea lions and are less vocal, their movements and behavior are often more difficult to observe at night. In general, harbor seals are more timid and easily disturbed than California sea lions. Thus, based on past observations of sea lion disturbance thresholds and behavior, it is very likely that harbor seals evacuate exposed haul outs in the impact area during fireworks displays, though they may loiter in adjacent surface waters until the fireworks have concluded.

f. Estimated levels of incidental take of marine mammals

As discussed above, the two marine mammals NMFS believes likely to be taken by Level B harassment incidental to fireworks displays authorized within the Sanctuary are the California sea lion (*Zalophuus californianus*) and the harbor seal (*Phoca vitulina richardsi*), due to the temporary evacuation of usual and accustomed haul-out sites. Both of these species are protected under the MMPA, and neither is listed under the ESA. Numbers of animals taken by Level B harassment are expected to vary due to factors such as tidal state, seasonality, shifting prey stocks, climatic phenomenon (such as El Nino events), and the number, timing, and location of future displays. The take of sea lions and harbor seals was estimated using a synthesis of information, including data gathered by MBNMS biologists at the specific display sites, results of independent surveys conducted in the MBNMS, and population estimates from government wildlife surveys covering larger geographic areas. More detailed information regarding the estimates of take of sea lions and harbor seals may be found in the application at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm.

With the incorporation of mitigation measures proposed below, NMFS expects that only Level B incidental harassment of a small number of pinnipeds may occur as a result of the proposed authorized coastal fireworks displays. NMFS further believes that the fireworks displays will have a negligible impact on the affected species and stocks and will not have an unmitigable adverse impact on the availability of such species or stocks for subsistence uses.

California Sea Lions

Stage structure of California sea lions within the Sanctuary varies by location, but generally, the majority are adult and sub-adult males. Weise (2000) reported on the stage structure of California sea lions at two historic fireworks display areas within the MBNMS, and speculated that juveniles may haul out at the Monterey jetty in large numbers due to a need for a more protected haul-out location. He also reported that most animals on Año Nuevo Island appeared to be adult males and suggested that the stage structure may vary between mainland haul-out sites and offshore islands and rocks. At all four designated display areas combined, twenty fireworks events per year could disturb an average total of 2,630 California sea lions,

with the maximum being 6,170 animals, out of a total estimated population of 237,000-244,000. These numbers are small relative to the population size (1.1-2.6 percent).

Harbor Seals

At all four designated display areas combined, twenty fireworks events per year could disturb an average of 302 harbor seals and a maximum of 1,065 harbor seals within the Sanctuary out of a total estimated population of 27,836. These numbers are small relative to the population size (1.1-3.8 percent). Nicholson (2000) studied the stage structure of harbor seals on the northeast Monterey Peninsula (an area with the largest single concentration of animals within the Sanctuary) for two years. For the final spring season of the study, survey numbers equate to a stage structure comprising 38% adult females, 15% adult males, 34% sub-adults, and 13% yearlings or juveniles.

2. Potential Indirect Effects on Marine Mammals and Other Sanctuary Resources

a. Chemical Residue

Possible indirect impacts to marine mammals and other marine organisms include those resulting from chemical residue or physical debris emitted into the water. When an aerial shell detonates, its chemical components burn at high temperatures, which usually promotes efficient incineration. Pyrotechnic vendors have stated that the chemical components are incinerated upon successful detonation of the shell. However, by design, the chemical components within a shell are scattered by the burst charge, separating them from the casing and internal shell compartments.

Chemical residue is produced in the form of smoke, airborne particulates, fine solids, and slag (spent chemical waste material that drips from the deployment canister/launcher and cools to a solid form). The fallout area for chemical residue is unknown, but is probably similar to that for solid debris. Similar to aerial shells, the chemical components of low-level devices produce chemical residue that can migrate to ocean waters as a result of fallout. The point of entry would likely be within a small radius (about 100 yards) of the launch site.

The MBNMS has found only one scientific study directed specifically at the potential impacts of chemical residue from fireworks upon the environment. A 1992 Florida study (DeBusk et al. 1992) indicates that chemical residues (fireworks decomposition products) do result from fireworks displays and can be measured under certain circumstances. The report, prepared for the Walt Disney Corporation in 1992, presented the results of a 10-year study of the impacts of fireworks decomposition products (chemical residue) upon an aquatic environment. Researchers studied a small lake in Florida subjected to two thousand fireworks shows over a ten-year period to measure key chemical levels in the lake. The report concluded that detectable amounts of barium, strontium, and antimony had increased in the lake but not to levels considered harmful to aquatic biota. The report further suggested that "environmental impacts from fireworks decomposition products typically will be negligible in locations that conduct fireworks displays infrequently". Based on the findings of this report, the lack of any evidence

that fireworks displays within the Sanctuary have degraded water quality, and the fact that the chemical byproducts of less frequent fireworks displays in an open marine system are even less likely to accumulate to a harmful level than those described in the report, NMFS and the MBNMS believe that chemical residue from fireworks does not pose a significant risk to the marine environment. No negative impacts to water quality have been detected.

b. Debris

The fallout area for the aerial debris is determined by local wind conditions. In coastal regions with prevailing winds, the fallout area can often be projected in advance. This information is calculated by pyrotechnicians and fire department personnel in selection of the launch site to abate fire and public safety hazards. Mortar tubes are often angled to direct shells over a prescribed fallout area, away from spectators and property. Generally, the bulk of the debris will fall to the surface within a 1/2 statute mile radius of the launch site. In addition, the tops of the mortars and other devices are usually covered with household aluminum foil to prevent premature ignition from sparks during the display and to protect them from moisture. The shells and stars easily punch through the thin aluminum foil when ignited, scattering pieces of aluminum in the vicinity of the launch site. Through various means, the aluminum debris and garbage generated during preparation of the display may be swept into ocean waters.

Some low-level devices may project small casings into the air (such as small cardboard tubes used to house flaming whistle and firecracker type devices). These casings will generally fall to earth within a two hundred yard radius of the launch site, since they do not attain altitudes sufficient for significant lateral transport by winds. Though typically within 300 ft (91 m), the impact area for set piece devices can extend to 1/2 statute mile from the center of the ignition point depending on the size and height of the fixed structure, the number and type of special effects, wind direction, atmospheric conditions, and local structures and topography. Like aerial shells, low-level pyrotechnics and mortars are often covered with aluminum foil to protect them from weather and errant sparks, pieces of which are shredded during the course of the show and initially deposited near the launch site.

The explosion in a firework separates the cardboard and paper casing and compartments, scattering some of the shell's structural pieces clear of the blast and burning others. Some pieces are immediately incinerated, while others burn up or partially burn on their way to the ground. Many shell casings simply part into two halves or into quarters when the burst charge detonates and are projected clear of the explosion. However, during the course of a display, some devices will fail to detonate after launch (duds) and fall back to earth/sea as an intact sphere or cylinder. Aside from post display surveys and recovery, there is no way to account for these misfires. The freefalling projectile could pose a physical risk to any wildlife within the fallout area, but the general avoidance of the area by wildlife during the display and the low odds for such a strike probably present a negligible potential for harm. Whether such duds pose a threat to wildlife (such as curious sea otters) once adrift is unknown. After soaking in the sea for a period of time, the likelihood of detonation rapidly declines. Even curious otters are unlikely to attempt to consume such a device. At times, some shells explode in the mortar tube (referred to as a flower pot) or far below their designed detonation altitude. It is highly unlikely that mobile organisms

would remain close enough to the launch site during a fireworks display to be within the effective danger zone for such an explosion.

The MBNMS has conducted surveys of solid debris on surface waters, beaches, and subtidal habitat and has discovered no visual evidence of or chronic impacts to the environment or wildlife. Aerial displays generally produce a larger volume of solid debris than low-level displays. Past MBNMS fireworks Authorizations (discussed later) require the fireworks sponsor to clean area beaches of fireworks debris for up to two days following the display. In some cases, debris has been found in considerable quantity on beaches the morning following the display. The MBNMS staff have recovered many substantial uncharred casing remnants on ocean waters immediately after marine displays. Other items found in the impact area are cardboard cylinders, disks, and shell case fragments; paper strips and wading; plastic wading, disks, and tubes; aluminum foil; cotton string; and even whole unexploded shells (duds or misfires). In other cases, virtually no fireworks debris was detected. This variance is likely due to several factors, such as type of display, tide state, sea state, and currents. In either case, due to the requirement for the fireworks sponsor to clean up following the displays, NMFS and the MBNMS do not believe the small amount of remaining debris is likely to significantly impact the environment, including marine mammals or their habitat.

c. Increased Boat Traffic

Increased boat traffic is often an indirect effect of fireworks displays as boaters move in to observe the event. The more boats there are in the area, the larger the chance that a boat could potentially collide with a marine mammal or other marine wildlife. The number of boats present at any one event is largely dependent upon weather, sea state, distance of the display from safe harbors, and season. At the MBNMS, some events have virtually no boat traffic, while others may have as many as 40 boats ranging in size from 10 to 65 feet in length.

Prior to and during fireworks displays at the MBNMS, boats typically enter the observation area at slow speed (less than 8 kts) due to the other vessels present and limited visibility (i.e., most fireworks displays occur at night). The U.S. Coast Guard and/or other federal agency vessels are on site to enforce safe boating laws and keep vessels out of the debris fallout area during the display. Most boaters anchor prior to the display, while others drift with engines in neutral for convenient repositioning.

MBNMS staff have observed boat traffic during several fireworks displays and generally found that boaters are using good boating and safety practices. They have also never witnessed the harassment, injury, or death of marine mammals or other wildlife as a result of vessels making way at these events. In general, as human activity increases and concentrates in the viewing areas leading up to the display, wildlife avoid or gradually evacuate the area. As noted before, the fireworks venues are marine areas with some of the highest ambient levels of human activity in the MBNMS. Many resident animals are accustomed to stimuli such as emergency sirens, vehicle noise, boating, kayaking, swimming, tidepooling, crowd noise, etc. Due to the gradual nature of the increase in boat traffic, it's infrequent occurrence and short duration, and

the slow speed of the boats, NMFS does not believe the increased boat traffic is likely to significantly impact the human environment, including marine mammals.

d. Fire

The marine venue is the preferred site for fireworks displays in coastal areas, in part, due to the considerable reduction of fire hazard by siting the aerial debris fallout zone over ocean waters. While there is no guarantee that all airborne embers will fall into the water, siting is managed for that intent. The coastal areas of California generally receive more moisture than the interior areas and are inherently less prone to wildfire than the drier upland regions. Authorized fireworks launch sites within the MBNMS are primarily located on sand beaches or steel/concrete offshore barges, minimizing fire hazard at a launch site, even if devices explode prematurely on the surface.

All coastal fireworks displays within the MBNMS must be authorized by a fire marshal permit in accordance with California state law and local ordinances. In issuing such permits, a local or state fire marshal establishes terms and conditions to protect spectators and property from potential fire hazards associated with fireworks displays. The terms and conditions govern the siting of the launch site away from flammable materials and environments and establish viewing areas a prescribed safe distance from the launch site in the event of misfires or premature detonations. These permits typically require that fire fighting equipment (e.g. fire engines and trucks) be on-scene during the display to respond to any fire emergency. The permits also govern the unloading, handling, and preparation of pyrotechnics for the display.

Display preparation requires the placement of racks of mortar tubes on a flat surface (usually a sand beach or barge) distant from vegetation, structures, and overhangs. The racks may be partially buried on a sand beach or in long, narrow boxes filled with sand. Ground displays are usually affixed to wooden frameworks staked into the ground or fixed to a sturdy base. Fireworks devices are detonated electrically from a central control box connected to the launch tubes and other devices by wire. Preparation of the launch site involves no more than short-term negligible impacts to the surrounding environment. Sanctuary Authorizations require fireworks sponsors to collect all debris at and near a fireworks launch site following each display, including mortars, racks, frameworks, stands, undetonated devices, wrappers, paper debris, etc.

Where boat traffic is expected to attend a coastal fireworks display, the U.S. Coast Guard issues a marine event permit and establishes a safety zone over the waters below the impact zone. Coast Guard and/or other public safety vessels patrol the zone during the fireworks display to assure that spectator vessels remain out of the area where airborne fireworks debris and embers are likely to fall. In Monterey, the fire department deploys its fire boat to augment the Coast Guard patrol. At Aptos, State Parks deploys an enforcement vessel to assist the Coast Guard. At Half Moon Bay, the harbor authorities provide a safety patrol during the event.

The culmination of the above measures considerably minimize the risk of fire resulting from coastal fireworks displays within the MBNMS. Since the MBNMS began authorizing

coastal fireworks displays in 1993, no uncontrolled fires have occurred, and no property or marine resources have been damaged due to fire.

3. Impact on Marine Wildlife Habitat (Habitat Exclusion)

Impacts on marine mammal habitat are part of the consideration in making a finding of negligible impact on the species and stocks of marine mammals. Impacts upon Sanctuary habitat are also considered for any activity reviewed for a Sanctuary Authorization. Habitat includes, but is not necessarily limited to, rookeries, mating grounds, feeding areas, roosting areas, nest sites, and areas of similar significance. The amount of debris and chemical residue resulting from fireworks displays authorized in the MBNMS is determined by wind conditions, weather, and other local variations. LOAs and Sanctuary Authorizations will require fireworks sponsors to clean up affected areas following approved fireworks displays. No evidence of water quality deterioration has been found in relation to prior MBNMS fireworks displays and Section (VI)(A)(2) of this document discusses the 1992 Walt Disney report, which found that environmental impacts from fireworks decomposition products typically will be negligible in locations that conduct fireworks displays infrequently. Because of the aforementioned mitigation measure and report, NMFS does not expect the debris and residue resulting from authorized fireworks displays to significantly impact marine mammals or marine mammal habitat in the MBNMS. Likewise, the MBNMS has determined that fireworks debris has only negligible short-term effects upon Sanctuary resources and qualities.

4. Potential Cumulative Effects

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7).

With the exception of regular ongoing boat and aircraft traffic and urban background noise levels at some sites, NMFS and MBNMS are aware of no other human activities occurring in the action area that may affect marine mammals. NMFS notes here that stress from long-term and continuous cumulative sound exposures can result in physiological effects on reproduction, metabolism, and general health, or on marine mammals' resistance to disease. However, because of the infrequent nature and short duration of the noise generated from the fireworks, and adaptation of urban marine mammal populations to elevated sound levels, NMFS does not believe that cumulative impacts are likely to occur at MBNMS as a result of the issuance of LOAs for the permitting of limited fireworks displays by the MBNMS. We anticipate impacts to be limited to temporary behavioral disturbance and displacement of marine mammals from their accustomed haulouts during the actual fireworks.

Since 1993, 67 fireworks displays have been conducted within the Sanctuary. MBNMS staff have been opportunistically monitoring sea lions at the City of Monterey's Fouth of July celebration for more than 10 years. Their general observations may be summarized as follows: sea lions begin leaving the breakwater as soon as the fireworks begin, clear completely off after

an aerial salute or quick succession of loud effects, usually begin returning within a few hours of the end of the display, and are present on the breakwater at pre-firework numbers by the following morning. No long term effects on the population of either species of pinniped have been noted, and, in fact, the California sea lion population has increased and is growing at a current rate of 5.4 to 6.1 percent per year and the harbor seal population in California is healthy and growing at a current rate of 3.5 percent per year.

In upcoming years (during the five-year duration of the regulations), the number of fireworks displays in the Sanctuary throughout a given year may increase by two and a half times (up to 20 authorized per year versus the average 7 per year previously). However, LOAs and the USFWS Biological Opinion will limit fireworks displays by number of displays, geographical area, display duration, temporal interval, and seasonal restrictions for the express purpose of minimizing cumulative impacts to wildlife and habitat. Due to these measures and additional terms and conditions applied by the Sanctuary, NMFS and the MBNMS do not believe that authorization of fireworks displays within the Sanctuary, including an increase in number up to the maximum authorized under the regulations, will produce measurable cumulative impacts.

5. Impacts on Endangered Species

As mentioned earlier in this document, the Steller sea lion and several species of federally listed cetaceans may be present at MBNMS at different times of the year and could potentially swim through the fireworks impact area during a display. In a 2001 consultation with MBNMS, the Southwest Region, NMFS, concluded that the proposed fireworks displays is not likely to adversely affect federally listed species under NMFS' jurisdiction.

The MBNMS has not observed sea otter responses to fireworks events; however, sea otters do frequent all general display areas. As noted under Environmental Impacts above, otters and other species may temporarily depart the area prior to the beginning of the fireworks display due to increased human activities. Some otters in Monterey harbor have become quite acclimated to very intense human activity, often continuing to feed undisturbed, as boats pass simultaneously on either side and within 20 feet of the otters. It is therefore possible that select individual otters may have a higher tolerance level than others to fireworks displays. Sea otters in residence within the Monterey harbor display a greater tolerance for intensive human activity than their counterparts in more remote locations. Past Sanctuary observations have not detected any disturbance to California sea otters as a result of the fireworks displays; however, past observations have not included specific surveys for this species.

Within the scope of the potential effects of the MBNMS fireworks displays, the USFWS is responsible for regulating take of the southern sea otter and any terrestrial plants or animals. MBNMS consulted with the USFWS pursuant to Section 7 of the ESA regarding impacts to these species from fireworks displays. The USFWS issued a Biological Opinion (BiOp) on June 22, 2005, which concluded that the authorization of fireworks displays, as described in the preferred alternative, is not likely to jeopardize the continued existence of the southern sea otter, brown pelican, western snowy plover, San Francisco garter snake, California red-legged frog, Smith's blue butterfly, Monterey gilia, Menzie's wallflower, Monterey spineflower, or

Tidestrom's lupine and is not likely to destroy or adversely modify the critical habitat of the western snowy plover or Monterey spineflower.

More specifically, the USFWS further concluded that no southern sea otters would be taken as a result of the proposed fireworks events, and therefore issued neither an incidental take statement under the ESA nor an IHA. The USFWS found that an incidental take of brown pelicans in the form of harassment, injury, or mortality could occur as a result of pelicans flushing quickly in response to the visual or acoustic stimuli and subsequently colliding with boats, wires, or other objects in the area. The USFWS issued an incidental take statement for the brown pelican, but because they considered the chance of take resulting to be "remote and unpredictable", they did not exempt a specific number of birds, but instead included two terms and conditions that require MBNMS notify the USFWS if a dead pelican is found, and notify the USFWS if more than one dead pelican is found to discuss re-initiation of formal consultation. The Sanctuary authorization incorporates these terms and conditions by requiring that the entity authorized to conduct fireworks look for dead or injured wildlife during their debris cleanup the day after the fireworks display and that they report any dead or injured animals found immediately to the Sanctuary.

The BiOp did not include incidental take statements for any of the other species analyzed and did not include any other terms and conditions. The BiOp does, however, contain non-mandatory conservation recommendations for some of the other species, and the Sanctuary provides these conservation measures to authorized entities that will be conducting fireworks in areas to which the recommendations apply.

B. Issuance of LOAs and Sanctuary Authorizations for 7 Fireworks Displays

If LOAs and Sanctuary Authorizations for 7 fireworks displays per year were issued to the MBNMS, the nature of the effects on the marine environment and marine mammals (Level B harassment in the form of temporary abandonment of haulout sites) would be the same as those described above for 20 fireworks displays per year, however, the estimated numbers of pinnipeds taken by the activity would be smaller, or, potentially the number of times a single pinniped were exposed to fireworks in one year could be smaller. The number of marine mammals taken by Level B harassment is expected to vary due to factors such as tidal state, seasonality, shifting prey stocks, climatic phenomenon (such as El Nino events), and the number, timing, and location of future displays. If the 7 fireworks events per year continued at their historic locations, NMFS estimates they could disturb an average total of 1,070 California sea lions (2,795 maximum) out of a total estimated population of 237,000-244,000 (0.4-1.2 %) and an average total of 122 harbor seals (400 maximum) out of a total estimated population of 27,836 (0.5-1.4 %) within the Sanctuary. These numbers are small relative to the population size.

Limiting Sanctuary Authorizations for fireworks to 7 events per year would reduce overall disturbance to wildlife at fireworks launch sites within the Sanctuary, but it would have little measurable effect on species abundance or distribution within the Sanctuary due to the negligible short-term nature of the disturbance. Under this alternative, the same mitigation and

monitoring measures would be required as are required under the preferred alternative, which would further reduce the adverse effects to wildlife.

C. Issuance of LOAs to Individual Fireworks Sponsors

If LOAs were issued to individual fireworks sponsors, the activities would be the same, the same mitigation and monitoring would be required as in the two previous alternatives, the nature and extent of the effects on the marine environment would be the same as those described in (VI)(A) and (VI)(B) above, and the effects would similarly have a negligible impact on the affected species or stocks. This alternative primarily relates to administrative matters and has no direct bearing upon environmental consequences. By requiring multiple permits in lieu of one consolidated permit through the MBNMS, this alternative would increase administrative costs by NMFS and fireworks sponsors in order to comply with incidental take provisions of the MMPA.

D. No Action Alternative

If LOAs and Sanctuary Authorizations were not issued, any takes resulting from fireworks displays would be unauthorized, and a violation of the MMPA and NMSA would occur. If the MBNMS were to stop authorizing fireworks displays, the previously described risks to marine mammals and other marine wildlife would be eliminated; however, applicants could potentially consider alternate terrestrial venues, which are dangerous, as many fireworks displays occur at the height of the dry season, when area vegetation is particularly prone to ignition from sparks or embers. The central California region is a semi-arid environment with elevated fire hazards throughout the year. The relocation of fireworks displays inland would shift, and could significantly increase, environmental hazards to upland habitats. Such action would also pose increased hazards to public health and safety and property.

VII. MITIGATION AND MONITORING

In order to ensure that fireworks displays within the MBNMS will have the least practicable impact on marine mammals and their habitat under both the 20 displays per year (preferred) and the 7 displays per year alternatives, the MBNMS would adopt the following mitigation and monitoring requirements as part of an approved 5-year incidental take regulation (under the MMPA) and subsequent LOAs. Furthermore, the MBNMS would implement the mitigation measures as part of its fireworks Authorization process (under the NMSA) to protect overall Sanctuary resources and qualities.

A. Mitigation

NMFS has collaborated with the MBNMS and USFWS since 2001 to develop conservation measures that minimize fireworks impacts on protected species and the marine environment within the MBNMS by defining the locations, frequency, and conditions under which the MBNMS can authorize marine fireworks displays.

The mitigation measures can be grouped into five broad approaches for managing fireworks displays and will be implemented under alternatives 1 and 2 by the MBNMS:

(1) *Limit displays to certain seasons to safeguard reproductive periods*: This regulation does not authorize fireworks events between March 1 and June 30 of any year, since this period is the primary reproductive season for many marine species.

(2) *Establish four conditional display areas*: Traditional fireworks display areas within the MBNMS are located adjacent to urban centers where wildlife has often acclimated to human disturbances, such as low-flying aircraft, emergency vehicles, unleashed pets, beach combing, recreational and commercial fishing, surfing, swimming, boating, and personal watercraft operations. This regulation only authorizes fireworks displays in four prescribed areas of the Sanctuary. The conditional display areas (described earlier in detail) are located at Half Moon Bay, the Santa Cruz/Soquel area, the northeastern Monterey Peninsula, and Cambria (Santa Rosa Creek).

(3) *Create a per-annum limit on the number of displays allowed in each display area*: If properly managed, a limited number of fireworks displays conducted in areas already heavily impacted by human activity can occur with sufficient safeguards to prevent any long-term or chronic impacts upon local natural resources. This regulation authorizes no more than 20 displays along the entire Sanctuary coastline in order to prevent cumulative negative environmental effects from fireworks proliferation. Additionally, displays will be authorized at an average frequency equal to or less than 1 every 2 months in each conditional display area. Fireworks displays shall not exceed 30 minutes with the exception of two longer displays per year that shall not exceed 1 hour.

(4) *Retain Authorization requirements and general and special restrictions for each event*: The Sanctuary will continue to assess displays on a case-by-case basis, using specially developed terms and conditions to address concerns unique to fireworks displays (e.g. restricting the number of aerial "salute" effects used; requiring the removal of plastic and aluminum labels and wrappings; and requiring post-show reporting and cleanup). Such terms and conditions have evolved over twelve years, as the Sanctuary has sought to improve its understanding of the potential impacts that fireworks displays have upon marine wildlife and the environment. The MBNMS will implement general and special restrictions unique to each fireworks event as necessary.

(5) *Institute a 5-year Authorization system for annual displays*: The Sanctuary intends to institute a 5-year Authorization system for fireworks displays that occur annually at fixed locations in a consistent manner, such as municipal Independence Day shows. Authorizations will include special conditions that mitigate negative impacts upon species and habitat from fireworks displays, such as the requirement for Authorization holders to clean up debris following each event. Authorizations for fireworks displays will not be valid unless current LOAs have been issued by NMFS for unintentional harassment incidental to the displays.

The above conservation measures are designed to prevent an incremental proliferation of fireworks displays and disturbance throughout the Sanctuary and minimize area of impact by

authorizing displays in primary traditional use areas. They also place multiple special conditions on the displays and allow fireworks displays only during seasons that avoid sensitive wildlife breeding cycles. These measures and MBNMS Authorization conditions assure that protected species and habitats are not jeopardized by fireworks activities. They have been well received by local fireworks sponsors who have pledged their cooperation in protecting Sanctuary resources.

B. Monitoring and Reporting

The MBNMS has monitored commercial fireworks displays for potential impacts to marine life and habitats for 12 years. In July 1993, the MBNMS performed its initial field observations of professional fireworks at the annual Independence Day fireworks display conducted by the City of Monterey. Subsequent field observations were conducted in Monterey by the MBNMS staff in July 1994, July 1995, July 1998, March 1998 (private display), October 2000 (private display), July 2001, and July 2002. Documented field observations have also been made at Aptos each October from 2000 to 2005. The MBNMS staff have observed additional displays at Monterey, Pacific Grove, Capitola, and Santa Cruz, but those observations were primarily for permit compliance purposes, and written assessments of environmental impacts were not generated. Though monitoring techniques and intensity have varied over the years and visual monitoring of wildlife abundance and behavioral responses to nighttime displays is challenging, observed impacts have been consistent. Wildlife activity nearest to disturbance areas returns to normal (pre-display species distribution, abundance, and activity patterns) within 12 hours, and no signs of wildlife injury or mortality have ever been discovered as a result of managed fireworks displays.

Of all the past authorized fireworks display sites within the Sanctuary, the City of Monterey site has received the highest level of Sanctuary monitoring effort. The City of Monterey has hosted a marine fireworks display each July 4th since 1988 (five years prior to designation of the MBNMS). The display is the longest running and largest annual commercial fireworks display within the Sanctuary. The Monterey Breakwater (approximately one half statute mile from the pyrotechnic launch site) was constructed in the 1930s and, along with other natural rock formations, has been a regular haul-out site for California sea lions and harbor seals for many decades. For this reason, the Monterey site has been studied and surveyed by government and academic researchers for over 20 years. Consequently, the Monterey site has the best background data available for assessing status and trends of key marine mammal populations relative to annual fireworks displays. Therefore, the MBNMS proposes that Monterey be monitored as necessary to assess how local California sea lion and harbor seal distribution and abundance are affected by an annual fireworks display.

The Sanctuary proposes conducting a visual census of the Monterey Breakwater and Harbor Rocks on July 4-5, 2006 to update annual abundance, behavioral response patterns, and departure and return rates for California sea lions and harbor seals relative to the July 4 fireworks display. Data will be collected by an observer aboard a kayak or small boat and from ground stations (where appropriate). The observer will use binoculars, counters, and data sheets to census animals. The pre and post fireworks census data will be analyzed to identify any significant temporal changes in abundance and distribution that might be attributed to impacts

from the annual fireworks display. The data will also be added to past research statistics on the abundance and distribution of stocks at Monterey Harbor.

It should be noted however that annual population trends at any given pinniped haul-out site can be influenced by a myriad of environmental and biological factors, ranging from predation upon pups at distant breeding colonies to fluctuating prey stocks due to El Nino events. These many variables make it difficult to measure and differentiate the potential impact of a single stimulus on long-term population trends.

The Sanctuary also proposes to conduct one-time acoustic monitoring at a future City of Monterey Fourth of July fireworks display. The procedures and equipment for this monitoring will be outlined and described in the proposed rule, the regulations, and appropriate LOA.

In addition to the comprehensive behavioral monitoring to be conducted at the Monterey Bay Breakwater in 2006, under alternatives 1 and 2 MBNMS will require its applicants to conduct a pre-event census of local marine mammal populations within the fireworks impact area each year. Each applicant will also be required to conduct post-event monitoring in the fireworks impact area to record injured or dead marine mammals brown pelicans, and other wildlife.

Under a NMFS LOA (alternatives 1 and 2) a draft final report must be submitted to NMFS within 60 days after the conclusion of each calendar year. A final report must be submitted to the Regional Administrator within 30 days after receiving comments from NMFS on the draft final report. If no comments are received from NMFS, the draft final report will be considered to be the final report. In addition, the MBNMS will continue to incorporate updated census data from government and academic surveys into its analysis and will make its information available to other marine mammal researchers upon request.

Last, a comprehensive draft final report must be submitted to NMFS 120 days prior to the expiration of the regulations, and a final report submitted within 30 days after receiving comments from NMFS on the draft final comprehensive report.

As stated previously, NMFS and MBNMS have identified no other directed research or monitoring efforts (within California or elsewhere) that specifically address the impacts of fireworks on pinnipeds. The Sanctuary coordinates a Research Activities Panel comprised of 21 marine research institutions and organizations adjacent to the Sanctuary and receives constant updates of ongoing research within the Sanctuary that might be related to this issue. The MBNMS is coordinating with researchers at the NMFS, the USFWS, the California Department of Fish and Game, and various specific research institutions concerning the status and local trends of wildlife stocks in the Sanctuary.

VIII. CONCLUSION

As a result of this environmental review, NMFS and the National Marine Sanctuary Program have determined that the implementation of any of the four alternatives (the issuance of

LOAs and Sanctuary Authorizations for 20 displays, the issuance of LOAs and Sanctuary Authorizations for 7 displays, the issuance of LOAs to individual fireworks sponsors, or the denial of the permit and MBNMS Authorizations) will not significantly affect the quality of the human environment. Additionally, the issuance of these Authorizations is not controversial (one general comment of opposition was received during the 30-day comment period) and will not set a precedent for future actions with significant effects. Accordingly, an environmental impact statement is not required.

IX. REFERENCES

Bonnell, M.L., M.O. Pierson, and G.D. Farrens. 1983. Pinnipeds and sea otters of Central and Northern California, 1980-1983: status, abundance, and distribution. Part of investigator's final report: marine mammal and seabird study, central and northern California, contract #14-12-0001-29090. Prepared for OCS Region, Minerals Management Service, U.S. Department of the Interior.

Caretta, J.V., K.A. Forney, M.M. Muto, J. Barlow, J. Baker, and M. Lowry. 2004. U.S. Pacific Marine Mammal Stock Assessments: 2003. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-358. 295p.

Caretta, J.V., M.M. Muto, J. Barlow, and J. Baker. 2002. U.S. Pacific Marine Mammal Stock Assessments: 2002. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-346. 286p.

Debusk, T.A., J.J. Keaffaber, B.R. Schwegler, and J. Repoff. 1992. Environmental Effects of Fireworks on Bodies of Water. Report prepared for Walt Disney Corporation.

Kryter, K.D. 1985. The effects of noise on man, 2nd ed. Academic Press, Orlando, FL. 688 p.

Lowry, M. 2001. Unpublished aerial survey data from Point Piedras Blancas to Bodega Rock. U.S. Department of Commerce. National Marine Fisheries Service, Southwest Fisheries Science Center.

U.S. Department of Commerce. 1992. Monterey Bay National Marine Sanctuary: Final Environmental Impact Statement/Management Plan. Sanctuaries and Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, Washington, D.C. 20235.

Nicholson, T.E. 2000. Social structure and underwater behavior of harbor seals in southern Monterey Bay, California. Master's Thesis. California State University at San Francisco, California 94132.

Odell, D.K., S.H. Ridgeway, and R.J. Harrison. 1981. California sea lion *Zalophus californianus* (Lesson, 1828); Handbook of Marine Mammals: Volume 1: The Walrus, Sea Lions. Academic Press, London.

Oxman, D. 1995. Seasonal abundance, movements, and food habits of harbor seals (*Phoca vitulina richardsii*) in Elkhorn Slough, California. Master's Thesis. California State University at Stanislaus, Turlock, California 95382.

Page, G.W., and L.E. Stenzel (eds.). 1981. The breeding status of the snowy plover in California. Western Birds 12(1):1-40.

Page, G.W., L.E. Stenzel, W.D. Shuford, and C.R. Bruce. 1991. Distribution and abundance of the snowy plover on its western North American breeding grounds. Journal of Field Ornithologists 62:245-255.

Richardson, W.J., C.R. Greene, Jr., C.I. Malme and D.H. Thomson. 1995. Marine mammals and noise. Academic Press, San Diego. 576 p.

SRS Technologies, 2001. Modification of the Final Rule: Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Rocket Launches at Vandenberg Air Force Base, California

Trumble, S. 1995. Food habits, dive behavior, and mother-pup interactions of harbor seals (*Phoca vitulina richardsi*) near Monterey Bay, California. Master's Thesis. California State University at Fresno, Fresno, California 93740.

U.S. Fish and Wildlife Service (USFWS). 1983. California brown pelican recovery plan. Portland, Oregon. 179 pp.

U.S. Fish and Wildlife Service (USFWS). 2001. Western Snowy Plover (*Charadrius alexandrinus nivosus*) Pacific Coast Population Draft Recovery Plan. Portland, Oregon. xix + 630 pp.

Weise, M.J. 2000. Abundance, food habits, and annual fish consumption of California sea lions (Zalophus californianus) and it's impact on salmonid fisheries in Monterey Bay, California. Master's Thesis. California State University at San Jose, San Jose, California 95192.

Prepared by:

Jolie Harrison
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service

Date

Prepared by:

Scott Kathey
Resource Protection Team
Monterey Bay National Marine Sanctuary
National Marine Sanctuary Program

Date

Recommended by:

Michael Payne
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service

Date

Recommended by:

Karen Grimmer
Monterey Bay National Marine Sanctuary
National Marine Sanctuary Program

Date

TENTATIVE ORDER NO. R9-2011-0022 GENERAL NPDES PERMIT FOR RESIDUAL FIREWORK POLLUTANT WASTE DISCHARGES TO WATERS OF THE UNITED STATES IN THE SAN DIEGO REGION FROM THE PUBLIC DISPLAY OF FIREWORKS

(Comments by John Lormon, March 7, 2011)

The above referenced Tentative General Permit ("Order") covers residual firework pollutant waste to inland surface waters, enclosed bays and estuaries, harbors, lagoons, and the Pacific Ocean. The Order is scheduled to be heard on May 11, 2011 by the California Regional Water Quality Control Board ("Regional Board") and shall become effective of June 1, 2011 and expire on May 31, 2016, and staff is holding a workshop on Friday March 11 from 9:00 until 3:00 p.m. The comments provided below are provided for consideration by the staff prior to the workshop.

I. GENERAL COMMENTS

It should be recognized that the Regional Board's effort to regulate fireworks displays is novel and appears to be driven by the threat of a citizen suit as much as it is by the need to control the discharges. Because the Regional Board must make findings to justify the issuance of the Order, and because these findings must be supported by substantial evidence in the record, the Board will rely on the factual assertions and support provided by the staff reports and the record made at the public hearing. In its current state the evidence will not support issuance of the Order.

For example, the existing Sea World fireworks monitoring data tells us that it would take more than 100 years for a comparable once-a-year fireworks event to create water quality and sediment effects such as exist at Sea World.[1] Unlike the stagnant and shallow Mission Bay water, San Diego Bay is deeper and more dynamic and even for a 1,000 pound display, the extensive monitoring required (directly or collaboratively) for such a show cannot be justified. For the Board to impose such monitoring the burden, including costs, of this obligation must bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. While the Board may seek information from the discharger, it is constrained to do so only as may be reasonably required.[2] Applying these principles to this case, there is no support to justify monitoring of occasional events.

The Order applies to any person discharging fireworks over surface waters. However, for certain firework events it includes additional and expensive requirements,(principally monitoring and reporting). Whether these more strenuous obligations apply depends on the geographical location of the discharge (San Diego Bay and Mission Bay) and for these locations, the net weight of the fireworks discharged (1,000 pounds per year). Thus, if a display discharges fireworks debris into surface waters other than those listed, no matter how many pounds of fireworks that are involved, the permit obligations are less strenuous. This result seems arbitrary and not consistent with water quality programs and policy.

[1] It is not reasonable to assume that the Sea World shows with less than 1,000 pound fireworks do not contribute to the cumulative impact identified in the Mission Bay monitoring of their major holiday fireworks events.
[2] California Water Code sections 13267 and 13383.

For the reasons set out below, this Order should only include BMPs for fireworks displays, even if such displays are 1,000 pounds or greater, and the monitoring obligations proposed in the Order should be limited to shows based on frequency and weight of the discharge not the pre-detonation weight of the fireworks for the Regional Board only regulates the waste discharged to the waters of the U.S. or the State. Further, no monitoring requirements should be imposed on the discharges into San Diego Bay, or to infrequent discharges into Mission Bay.

II. COVERED DISCHARGES

Professional pyrotechnic devices used in firework displays can be grouped into three general categories: (i) aerial shells (paper and cardboard spheres or cylinders filled with pyrotechnic materials; (ii) low-level comet and multi-shot devices such as roman candles; and (iii) set piece displays mounted on the ground.

1. For covered firework events, staff asserts that residual firework pollutant waste discharged into surface waters constitutes discharge of a pollutant from a "point source" within the meaning of the CWA. Yet, staff fails to provide adequate legal support for the contention that fireworks displays constitute a point sources. Instead staff simply concludes that these events are subject to the Clean Water Act ("CWA") regulation. Staff should provide the factual and legal support for its belief that fireworks are subject to section 402 of the CWA. Even if fireworks displays are subject to section 402, we believe that BMP are the appropriate way to obtain compliance with section 402. BMP requirements set out in section V.B. of the Order are all that should be required especially in San Diego Bay which experiences strong tidal mixing which is up to 50 feet deep, thirteen miles long and a mile and a half wide in some sections, characteristics that are different from Mission Bay.[3]

2. Before the Board can adopt this Order it must make findings that are supported by "substantial evidence." These findings must "bridge the analytical gap between raw evidence and ultimate decision or order." See, *Topanga Assn. For a Scenic Community v. County of Los Angeles* (1974), 11 Cal. 3d 506, 515 [113 Cal. Rptr. 836]. In its current form the Order is replete with loose factual elements and speculation and this is especially true in regards to the support for the monitoring requirements. To construct the bridge between the evidence and the decision, the evidence relied upon must be substantial evidence, (i.e., "[I]t must be reasonable in nature, credible, and of solid value; it must actually be substantial proof of the essentials which the law requires in a particular case." *Bank of America v. State Water Resources Control Bd.* (1974), 42 Cal. App. 3d 198, 213.)

3. We recognize that the courts are hesitant to substitute their judgment for the agency's, and that makes it all the more important that the Board rely on the facts

[3] For a water body such as San Diego Bay, BMPs designed to limit and remove residual fireworks debris will provide adequate protection.

supported by substantial evidence in the record. This is equally true in regards to all elements of the Order including the monitoring obligations for San Diego Bay as provided in the Order.[4]

4. Staff uses Sea World's water quality, sediment, and benthic infauna monitoring data to support its recommendation that regulation of fireworks and monitoring is necessary. Staff noted that for more than a decade Sea World has conducted between 110 and 120 fireworks events per year, that the events take place in the same general location, and that these events "represent the maximum fireworks pollutant loading conditions and cumulative effects due to a combination of 1) the restricted circulation of waters within Mission Bay, 2) the shallow depth of the bay in the vicinity of the fireworks events, and 3) the high frequency of repeat fireworks events …." Fact Sheet: Attachment F – Fact Sheet, I. Discharge Information. ("Attachment F"), p. F-12.

5. Staff recognizes that other water bodies can exhibit different and unique effects from fireworks discharges due to site specific water body conditions. And, that even in the case of Sea World, for the average show (i.e., less than 1, 000 pounds) there is "little evidence of pollutants within the receiving water column at levels above applicable water quality criteria or detected reference site levels." Further, sample results fall below both the continuous exposure and maximum exposure California Toxics Rule ("CTR") concentrations. *Id.* pp. F-12 and F-13.

6. For three holiday related events, (with 1,000 pounds of net explosive weight per event), water chemistry monitoring showed one exceedance of instantaneous water quality criteria for phosphorous and elevated levels of some metals over the reference site.[5] Staff acknowledges that "lack of accumulation and exceedances of water quality criteria" exists, and they suggest reasons why this is the case. For example, CTR measures "dissolved" water chemistry instead of NPDES permit effluent limitations "total recoverable metal" standard, when in fact, there could be many reasons for the absence of exceedance except for one of the 19 chemicals of concern found in fireworks. For example, when the fireworks detonate the residual is consumed leaving de minimis or no amounts of waste falling into the water.

7. We must recognize that Sea World's major events were discharged into the same area of Mission Bay where more than 1,000 other (albeit smaller) fireworks shows had taken place over the past decade. Such a situation does not exist in other parts of Mission Bay nor in San Diego Bay. There are many factors that could affect monitoring results especially when only one or two constituents are identified. For example, tidal magnitude and mixing, salinity, prop wash, bottom fish feeding habits, dry and wet weather flow from a storm drains and other non-point sources all could play a role in the results seen in the Sea World monitoring.

[4] Note that for inland surface waters fireworks displays can exceed 1,000 pounds net weight and unless shown otherwise by staff and there is no monitoring obligation imposed on that event even if it is a 303(d) impaired water body. The presumption is just the reverse for San Diego and Mission Bay.

[5] The only metals whose levels in the sediment in the discharge zone that were at or above instantaneous dissolved CTR criteria were copper and zinc. And, the source of these metals could be from MS4 and past City of San Diego solid waste disposal practices, or the sludge deposited by the City at Fiesta Island.

8. Field sampling and laboratory methods and practices could also affect the accuracy and validity of the limited Sea World sampling data. Nevertheless, staff disregards all of these potential effects, because they found that "water chemistry sampling found elevated pollutant levels relative to the reference sites after major events." *Id.* p. F-14. They then recommend imposing extensive monitoring on occasional fireworks events. We believe that the Board should not impose unnecessary and costly burdens on firework exhibits, as the evidence in the record does not support the conclusion that these events are the cause of impacts to the aquatic environment.

9. Furthermore, the Board can issue the Order, and require BMPs only to protect the beneficial uses and water quality criteria of the region. It can continue to require monitoring at Sea World, the worst case scenario; but, the fact that Sea World may potentially be creating a condition of pollution does not justify imposing the same information gathering burden on the occasional show in other locations.

10. The Order asks for a Water and Sediment Monitoring Plan which "must include a conceptual model developed by dischargers to dictate the design of the sediment monitoring program. The model is required to consider the physical and chemical fate and transport of pollutants. This effort *is expected to better define the nature of residual firework pollutant waste discharges into receiving waters, and <u>may</u> result in a more representative sampling methodology for water chemistry following fireworks discharges*." *Id.* (Emphasis added). Missing from the analysis is the fact that there is no evidence of an occasional show creating similar concerns that might exist at Sea World's Mission Bay site. As a result there is insufficient evidence to justify the extensive monitoring requested by staff in this Order. Staff is asking the Board to grant an improper license to search for a justification of the monitoring obligation where none exists.

11. In support of its request for the monitoring data, staff points to sections 13267 and 13383 of the Water Code. However, the legislature did not give the Board unfettered right to ask for information. The Board may require technical or monitoring reports, but the "burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Water Code section 13267(b)(1). Section 13383(b) allows that the Board may seek information "as may be reasonably required." Because these words should have meaning, the Board should not impose unnecessary and unreasonably burdens occasional firework events with costly monitoring requirements, even where those events exceed the 1,000 pound limits.[6]

12. Staff acknowledges that based on Sea World's sediment toxicity and benthic community analysis, it "was difficult to draw any conclusions regarding the benthic effects of fireworks displays to the difference found between the reference stations and the fireworks fallout area." *Id.* p. F-14. Additional monitoring is required to separate out other pollutant sources to Mission Bay, such as storm water discharges and non-point sources.

[6] This is not to say that a person could pull up to the bay and discharge unlimited amounts of fireworks waste into the bay. It must be remembered that there is no evidence to support a conclusion as to the weight of fireworks waste remaining after ignition. For fireworks exhibits, there are costs limitations on the size and length of the shows, with most shows lasting no more than 15 to 20 minutes with interludes between the discharges. All of these facts impose an economical limit on the frequency and amount of fireworks discharged.

Sampling in both reference sites and the fallout zone ranged from non-toxic to highly toxic. Yet, the reference sites and the fallout zone had different habitat and species composition, thus, it was difficult to detect any difference in short term toxicity between and among the sites. And, the sediment monitoring at Sea World shows elevated pollutants within the sediment, but toxicity testing and results are "inconclusive, and the benthic community results cannot reasonably be evaluated." *Id.* p. F-15.

13. Staff itself conceded that based on water quality data obtained to date, it is "unlikely that single fireworks events of a smaller size than SeaWorld's (sic) Fourth of July and Labor Day events would cause exceedances of applicable water quality criteria in the receiving waters. However, the ***continuous*** discharge of waste from large fireworks events may result in longer-term pollutant accumulation in bay sediment, similar to the enrichment seen in the SeaWorld (sic) discharge zone." *Id.* p. F-15. (Emphasis added.) Conceding that each water body can exhibit different effects as a result of the discharge, "it is anticipated that proper implementation of BMPs required under the Order would adequately control and abate the discharge of pollutant wastes from public fireworks events to surface waters in the San Diego Region.." *Id.* p. F-16. We agree that BMPs are appropriate as the limit of what is necessary for fireworks shows other than for those shows held on a frequent basis in a limited water body segment.

14. Finally, we note that the Order needs to add definitions for many terms which are now open to uncertainty and confusion. For example, what is the difference between discharger, sponsor and operator? Point source is not sufficiently interpreted nor applied to the unique nature of fireworks, which staff groups into three general categories. The definition for the term "net explosive weight" is not sufficient and leaves room for debate (see, Attachment A – Definitions, A-5.) The word "continuous" is not found in the definition section of the Order. There are other examples where clarity could be added to the Order by adding or modifying the definition section.

Thank you for the opportunity to provide these initial comments, and I request the right to include additional comments at the workshop and subsequent hearing on this Order.

600 West Broadway, Suite 1800
San Diego, California 92101-3375
Tel: +1.619.236.1234 Fax: +1.619.696.7419
www.lw.com

LATHAM & WATKINS LLP

March 7, 2011

VIA ELECTRONIC AND U.S. MAIL

San Diego Regional Board Members
David Gibson, Executive Director
c/o Michelle Mata
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, California 92123-4340

Re: Comment Letter – 03/11/2011 Board Workshop – Proposed General NPDES Permit for Public Displays of Fireworks

Dear Mr. Gibson and Honorable Board Members:

Thank you for the opportunity to comment on revised Tentative Order No. R9-2011-0022, NPDES No. CAG999002 ("Tentative Order"). We submit these comments on behalf of the La Jolla Community Fireworks Foundation ("LJCFF"), a non-profit corporation organized for the purpose of promoting patriotism and community spirit by preserving La Jolla's Fourth of July tradition of a public fireworks display located at Scripps Park.

As a threshold matter, we continue to maintain that the San Diego Regional Water Quality Control Board ("Regional Board") does not have the legal authority to regulate the public display of fireworks. As noted in our December 9, 2010 letter, we do not believe that there is precedent rooted in federal case law or any definition in the Clean Water Act ("CWA") that would categorize fireworks displays as a "point source" discharge under the CWA. Therefore, as a jurisdictional matter, fireworks displays cannot be regulated by the Regional Board under the NPDES program. While we understand the Regional Board nonetheless favors regulating occasional fireworks activity, we will continue to question the Regional Board's statutory authority to do so, especially where the Regional Board has not shown that the activity to be regulated is a "point source" under the CWA and in fact, acknowledges in the Tentative Order that this activity "poses no significant threat to water quality."[1]

Without waiving any rights to dispute the threshold issue of the limits of the Regional Board's regulatory authority, we believe that the revised Tentative Order makes thoughtful and reasonable findings based upon available science. We agree that the scientific evidence supports the conclusion that fireworks displays over water "pose no significant threat to

[1] Tentative Order at 8.

water quality"[2] and the "proper implementation of the BMPs" included in the Tentative Order "will assure the protection of water and sediment quality within the receiving waters."[3]

It is clear from the newly released Tentative Order that Regional Board staff made significant efforts to evaluate and respond thoughtfully to the technical and procedural issues raised by the stakeholders during the prior December 16, 2010 workshop and in their prior written comments. We very much appreciate this effort. The new Tentative Order proposed by the Regional Board is responsive to many key concerns. For example, the concept of structuring the Tentative Order upon a threshold of fireworks material makes scientific and practical sense, although we are concerned that the 1,000 pounds net weight threshold for "Category 1" and "Category 2" events unnecessarily sweeps the San Diego Symphony and U.S.S. Midway fireworks displays into the highest level of regulatory oversight on par with SeaWorld. We believe the annual weight limit should be higher for such periodic, short-duration San Diego Bay fireworks displays that in the aggregate may exceed 1,000 pounds net weight annually, but which involve insignificant pyrotechnic weight during each individual event.

LJCFF also believes that the Special Provisions of the Tentative Order at Section VII.C.2 (pages 24-25) related to the Ocean Plan and discharges to the La Jolla Area of Special Biological Significance ("ASBS") are also a reasonable approach. The launch site for the La Jolla Fourth of July fireworks display is from Scripps Park above La Jolla Cove, which is one-quarter mile outside and away from the La Jolla ASBS.

As noted above, we believe that the proposed Tentative Order and its findings have rigorously evaluated the science and strike a better balance. We have attached as Attachment "A" a list of comments on specific areas of the Tentative Order that we believe are necessary to better refine and improve the Tentative Order. We have also attached as Attachment "B" relevant pages of the Tentative Order with our proposed redline changes. We look forward to working with Regional Board staff in the future and thank the staff for the many improvements in the revised Tentative Order.

Very truly yours,

Robert M. Howard
of LATHAM & WATKINS LLP

Attachments

cc: Deborah Marengo *(w/attachments)*
Adam Harris *(w/attachments)*

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[2] Tentative Order at 8

[3] Tentative Order at 26

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ATTACHMENT "A"

LA JOLLA COMMUNITY FIREWORKS FOUNDATION COMMENTS ON TENTATIVE ORDER R-9-2011-0022

Section	Comment
II.B, p. 6	This section states that the Regional Board may require the joint submission of a Notice of Intent ("NOI") from both the sponsor and operator of the fireworks display. It is common for the operator of the fireworks display to handle regulatory permits from the Coast Guard, local fire agency, and others. It is likely that the NOI will become a similar service provided by the operator. Only one NOI, processed by the operator should be required. Non-profit groups sponsoring these events do not have the expertise or manpower to track these regulatory requirements.
II.C, p. 7	No later than June 10, 2011, or 24 days prior to the Fourth of July event in 2011, and 60 days starting in 2012, is not practicable or reflective of when this Order will be implemented.
II.C & II.D, pp. 7-8	These sections deal with the NOI and Notice of Enrollment ("NOE"). It is unclear whether a sponsor of a fireworks show will need to complete a NOI each year, prior to an annual Fourth of July fireworks show, and obtain a new NOE each year. Will a single NOI (and payment) in the first year of permitting followed by an NOE issued by the Regional Board suffice for the life of the Order, as long as no changes to the display are made?
II.F, p. 8	This section indicates that the current fee for enrollment under the Tentative Order will be $1120. This fee seems excessive, and beyond the required fee to process and oversee the Tentative Order, given the low level of regulatory oversight required by the Regional Board. We would suggest that two tiers of fees be applied; one for fireworks displays over 1,000 pounds, and one for displays under 1,000 pounds. It is clear from the permit that displays using less than 1,000 pounds of pyrotechnic material will pose no threat to water quality, and therefore minimal oversight will be required.

Section	Comment
III.A, p. 10	We respectfully disagree with the unsupported jurisdictional premise, "Residual firework pollutant waste discharged into surface waters constitutes discharge of pollution from a point source within the meaning of the CWA. Therefore coverage under an NPDES permit is required." Although we believe that the new Tentative Order provides a much better framework, we reserve our right to challenge a first-in-the-nation administrative determination that fireworks constitute a "pollutant discharge from a point source" under the CWA. Staff's prior justification that the San Diego SeaWorld displays received a NPDES permit misses the point that SeaWorld voluntarily agreed to permitting. One party's voluntary agreement to bind itself to a permit is not the same thing as a judicial determination of regulatory jurisdiction.
III.I and VII.C.2 and throughout the Tentative Order, pp. 13-14, p.VI-41	The Tentative Order provides special provisions and findings under the California Ocean Plan that will allow for the temporary discharge of fireworks material over the La Jolla ASBS. The Tentative Order states, "This Order establishes requirements for the continued discharge of residual fireworks pollutant waste by the La Jolla Community Fireworks Foundation into the La Jolla ASBS in San Diego County." (p. 14.) Please revise the language of this section to allow for a successor annual sponsor to obtain this right. For example, please change the language to read, "This Order establishes requirements for the continued discharge of residual fireworks pollutant waste by the La Jolla Community Fireworks Foundation (or a successor sponsor of the Fourth of July fireworks) into the La Jolla ASBS in San Diego County." On pages VI-41 and VI-42, the Tentative Order calls for information specific to the La Jolla Fourth of July event. The event has taken place for approximately 26 years, or since approximately 1984. The annual event conducted by the La Jolla Community Fireworks Foundation typically runs approximately 20-25 minutes and during that time less than 1,000 pounds (net weight) of aerial shells are ignited and launched. It is estimated that the 2010 event involved less than 500 pounds net weight of pyrotechnics. The rest of the requested information calls for such a level of detail from the past 26 shows that it cannot be confirmed at this juncture and is not necessary to the findings in the Tentative Order.

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Section	Comment
V.B.1, p. 19	The terms "practicable" and "economically feasible" are used in this section, but neither is defined in the Tentative Order. LJCFF contracts with a licensed, professional pyrotechnic company and is subject to the availability of the fireworks that they are able to acquire. We are concerned that this section could become a point of contention or future litigation because of the imprecise nature of the terms and what level of annual due diligence is required. The issue is an "industry standards" issue, not a "specific event" inquiry. We believe that V.B.1 should be removed from the Tentative Order entirely to avoid future litigation against specific events. Alternatively, the Order should specify which fireworks meet "industry standards" until the Order is renewed.
V.B.2, p. 19	This section requires the permittee to consider alternative firing ranges. The La Jolla Fourth of July fireworks displays have been launched from the same location (Scripps Park, La Jolla) for the last 26 years and have caused no degradation of water quality or impacts on surrounding land uses. The location allows spectators to walk to the park, provides an open and free environment to watch the display, and is located centrally in the village of La Jolla to provide maximum benefit to the local business community. Therefore, we believe that Scripps Park is the best and most appropriate location for the annual La Jolla event. We do not believe that we should be required to justify the current location of the event for 2011 or each and every subsequent year.
V.B.5, p. 20	"Collected material must be managed as hazardous waste." Please revise this language to read: "Collected materials must be managed ~~as hazardous waste~~ and disposed of consistent with their legal classification." Unexploded fireworks or exploded debris such as cardboard should be treated as required under current laws for disposal of such items. It is not appropriate for the Regional Board to create a separate regulatory regime for unexploded fireworks or exploded debris. Pyrotechnic companies provide removal and disposal services that are in compliance with all rules for collection and disposal of such material. Treatment as "hazardous waste" could require a hazardous waste disposal plans and waste discharger ID numbers and other regulatory requirements that are unnecessary and financially prohibitory.
VII.C.2, pp. 24-25	These provisions are acceptable. The LJCFF appreciates staffs attention to this point. LJCFF would note that the La Jolla Fourth of July Fireworks display is launched from Scripps Park, which is located one-quarter mile from the La Jolla ASBS.

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Section	Comment
Attachment C, pp. C-1 – C-2	Please change the second sentence in the "Post Event Report" to read: "Reports <u>for category 1 dischargers</u> shall be submitted to the San Diego Water Board…" We are unclear as to what "Solid Rocket Gross Weight" refers to. Page C-2: With regard to "environmentally friendly" fireworks, please see our comment on section V.B.1. Page C-2: "Defective Shells – List Manufacturer's Name, Size of Shell, and Malfunction": Investigation and scientific determinations about the source of any malfunction in defective shells is not something that LJCFF is qualified to provide. LJCFF contracts with a professional and licensed pyrotechnic company for a fireworks display, and it relies on the operator of the event for operation and cleanup. LJCFF is neither qualified nor equipped to provide the type of forensic investigation services called for by Attachment C. We believe that this section should be removed from Attachment C.

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ATTACHMENT "B"

Redlined relevant pages from Draft Tentative Order No. R9-2011-0022.

depending on wind speed and direction, size of the shells, the angle of mortar placement, the type and height of firework explosions and other environmental factors. Once the fireworks residue enters a water body it can be transported to waters and shorelines outside the fallout area due to wind shear and tidal effects. The Clean Water Act (CWA), at section 301(a), broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Residual firework pollutant waste discharged into surface waters constitutes discharge of a pollutant from a point source within the meaning of the CWA. Therefore, coverage under an NPDES permit is required before residual firework pollutant waste can be lawfully discharged.

This Order requires implementation of Best Management Practices (BMPs) described in Section V.B of this Order to ensure the pollutant waste discharges associated with the public display of fireworks do not cause pollution or nuisance conditions in surface waters within the San Diego Region. This Order also requires post firework event monitoring and reporting as well as receiving water monitoring and reporting for discharges meeting certain specific criteria described under specific conditions in Attachment E of this Order.

II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

A. General Permit Coverage

This General Permit covers the point source discharge of residual firework pollutant waste to surface waters resulting from the public display of fireworks, including but not limited to fireworks using aluminum, antinomy, barium, carbon, calcium, chlorine, cesium, copper, iron, potassium, lithium, magnesium, oxidizers including nitrates, chlorates and perchlorates, phosphorus, sodium sulfur, strontium, titanium, and zinc.

Users of fireworks containing these and other pollutant wastes for public shows or events are required to obtain coverage under this General Permit prior to the public display of fireworks.

B. Discharger Eligibility Criteria

Any person who proposes to discharge pollutant waste from the public display of fireworks to surface waters of the U.S. in the San Diego Region may submit a Notice of Intent (NOI) for coverage under this Order. The NOI may address multiple fireworks events at different locations throughout the San Diego Region. When a fireworks event(s) is sponsored by one ~~person~~ entity but is operated or conducted by another ~~person~~ entity, it is the ~~sponsor's~~

GENERAL PERMIT FOR
TENTATIVE ORDER NO. R9-2011-0022
PUBLIC DISPLAY OF FIREWORKS

operator's duty to submit an NOI and obtain coverage under this Order. ~~The San Diego Water Board may require the joint submission of an NOI from both the sponsor and the person operating the fireworks event on a case-by-case basis.~~

C. General Permit Application

To obtain coverage under this Order, Dischargers must submit a complete application containing the items below to the San Diego Water Board no later than 60 days prior to a fireworks event. During the period of May 11, 2011 through June 10, 2011 Dischargers must submit the complete application no later than 24 days prior to a fireworks event. The application must contain the following items:

1. A completed Notice of Intent (NOI) form shown as Attachment B signed in accordance with the signatory requirements of the Standard Provisions in Attachment D, Section V.B.1. Signatory and Certification Requirements;

2. Payment of the annual application fee, equal to the first annual fee, made payable to State Water Resources Control Board or "SWRCB"; and

3. A Fireworks Best Management Practices Plan.

The NOI, including, the application fee, and other attachments must be submitted to the following address:

CRWQCB – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: Fireworks General NPDES Order
NOTICE OF INTENT

D. Notice of Enrollment

The San Diego Water Board will review the application package for completeness and applicability to this Order. Notice of Enrollment (NOE) under this Order will be provided to the Discharger by the San Diego Water Board upon receipt of a complete NOI, Fireworks Best Management Practices Plan, and application fee. The NOE may include specific conditions not stated in this Order, including but not limited to receiving water and sediment monitoring. Any such specific conditions and requirements shall be enforceable. The effective enrollment date will be specified in the NOE and the Discharger is authorized to discharge

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Discharge Point	Receiving Water	Beneficial Uses
Various	Pacific Ocean	Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish spawning and shellfish harvesting

Section III.E.1 of the Ocean Plan provides that waste shall not be discharged to areas designated as being of special biological significance (ASBS). Section III.E.2. provides that the Regional Water Boards may, however, approve waste discharge requirements or recommend certification for limited-term (i.e. weeks or months) activities in ASBS. Limited term activities may result in temporary and short-term changes in existing water quality. Water quality degradation shall be limited to the shortest possible time. The activities must not permanently degrade water quality or result in water quality lower than that necessary to protect existing uses, and all practical means of minimizing such degradation shall be implemented.

This Order establishes requirements for the continued discharge of residual firework pollutant waste by the La Jolla Community Fireworks Foundation or their successors into the La Jolla ASBS in San Diego County and the City of Laguna Beach into the Heisler Park ASBS in Orange County.

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

J. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

K. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The SIP became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the San Diego Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became

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V. DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Not Applicable

B. Fireworks Best Management Practices Plan (FBMPP)

The Discharger shall prepare and implement a Fireworks Best Management Practices Plan (FBMPP) to prevent or reduce the discharge of pollutants associated with the public display of fireworks. The FBMPP shall address, at a minimum, the following elements:

1. ~~Whenever practicable and economically feasible, the Discharger shall consider the use of "environmentally friendly" 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~~.

2. Whenever practicable and feasible, the Discharger shall design the firing range, ~~or consider alternative firing ranges~~, to ~~eliminate or~~ reduce residual firework pollutant waste discharges to waters of the United States.

3. As soon as practicable, and no later than 24 hours following a public display of fireworks, the Discharger, in addition to complying with title 19 of the California Code of Regulations, section 1003, shall, to the extent practical, collect, remove, and manage particulate matter and debris from ignited and un-ignited pyrotechnic material including aerial shells, stars (small pellets of composition that produce color pyrotechnic effects), paper, cardboard, wires and fuses found during inspection of the entire firing range and adjacent affected surface water(s).

4. If the fireworks are launched or ignited on barges, the barges shall be setup in accordance with the requirements, and under the supervision of the Fire Department having jurisdiction. The "mortars" used to hold and launch the fireworks shall be secured properly and use fire-retardant material, such as sand, in accordance with local codes. Barges shall be inspected for leaks and other potential safety issues. Wires used to trigger the fireworks shall be secured on the barges to prevent the wires from being pulled into the air and falling into the water. As soon as practicable, and no later than 24 hours following a public display of fireworks, the Discharger shall sweep the decks of each barge to prevent debris and other solid waste from blowing into the water. The barges shall be returned to the loading or setup area to be further cleaned and to have the mortars removed.

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5. Immediately following a public display of fireworks, the Discharger shall collect and remove unexploded fireworks, including duds and misfires~~., and return them directly to the wholesaler/manufacturer.~~ Collected material must be managed ~~as hazardous waste~~ and disposed of consistent with their legal classification.

6. All debris including fuses, wires, and wrappings shall be properly disposed in trash receptacles as the fireworks display is set up.

7. Fireworks shall be packaged, transported, stored, set-up, and handled in accordance with California Code of Regulations, Title 19, Division1, Chapter 6, *Fireworks* and Title 22, Chapter 33, *Best Management Practices for Perchlorate Materials* in order to prevent or minimize firework pollutant wastes from entering surface waters.

8. Residual firework pollutant waste discharges shall be located a sufficient distance from areas designated ASBS to assure maintenance of natural water quality conditions in these areas, except as provided in Section VII.C.2, *Special Provisions for Discharges into La Jolla and Heisler Park ASBS* of this Order.

9. The Discharger shall establish procedures to ensure that all required permits, licenses, and approvals (i.e. State Fire Marshal's license, United States Coast Guard Marine Event Permit, etc.) from other governmental agencies for the public display of fireworks are obtained prior to the event.

C. Public Fireworks Display Log

The Discharger shall maintain a written log for each public fireworks display event. The log shall be completed within 5 days following each public fireworks event and shall be made available to the San Diego Water Board upon request. The log shall contain the following information:

1. The name of the organization sponsoring the fireworks event, together with the names and license numbers of the pyrotechnic operators actually in charge of the display;

2. The date, time, and duration of the public fireworks event;

3. The location of the public fireworks event;

4. The affected receiving waters;

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C. Special Provisions

1. Reopener Provisions

Order No. R9-2011-0022 may be re-opened and modified, revoked, and reissued or terminated in accordance with the provisions of 40 CFR 122, 123, 124, and 125. The San Diego Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations or adoption of new regulations by the State Water Board or San Diego Water Board, including revisions to the Basin Plan.

2. Special Provisions for Discharges into La Jolla and Heisler Park ASBS

Discharges of residual fireworks pollutant waste by the La Jolla Community Fireworks Foundation or their successor or follow on sponsor for the La Jolla Fourth of July Fireworks event into the La Jolla ASBS and by the City of Laguna Beach into the Heisler Park ASBS may continue subject to the following conditions:

a. The residual firework pollutant waste discharges shall be limited to those resulting from one Fourth of July celebration public fireworks display event per calendar year.

b. The net explosive weight of fireworks used in the public fireworks display event shall not exceed 1,000 pounds of pyrotechnic material.

c. The areal extent of the firing range in the ASBS shall be limited to the maximum extent practicable to prevent or reduce residual firework pollutant waste discharges in the ASBS.

d. The residual firework pollutant waste discharges shall not permanently alter natural water quality conditions in the ASBS receiving waters. Short term temporary excursions from natural ocean water quality[5] conditions resulting from residual firework pollutant waste discharges within any portion of the firing range located in the ASBS are permissible if beneficial uses are protected.

e. The residual firework pollutant waste discharges shall comply with all other applicable provisions, including water quality standards, of the Ocean Plan.

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[5] Natural ocean water quality will be determined by the Southern California Water Research Project (SCCWRP) ASBS Monitoring Program which is designed to define natural water quality in ASBS areas at selected reference sites.

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NPDES NO. CAG999002

III.
ATTACHMENT C – PUBLIC DISPLAY OF FIREWORKS POST EVENT REPORT FORM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

POST FIREWORKS DISPLAY REPORT

This form shall be completed no later than five (5) days following a public display of fireworks event and made available to the San Diego Water Board upon request. Reports for category 1 dischargers shall be submitted to the San Diego Water Board in accordance with the schedule outlined in Section X.B.3 of the Monitoring and Reporting Program.

Completed forms may be submitted electronically on compact disk or by hard copy to the San Diego Water Board office. The San Diego Water Board may accept electronic submission of this form (Check with the San Diego Water Board before submitting electronically).

Name of Organization Sponsoring the Event	WDID No.
Contact Person for Organization Sponsoring the Event: Name: Phone Number: Email:	
Location of Event – Address and GPS Coordinates	Name of Receiving Water(s)
Date of Display	Time of Display FROM .M to .M
Map. Attach a map or diagram identifying the firing range, adjacent shorelines, quays, and docks, any other appropriate features of the firing range and adjacent affected surface water(s). The firing range is that area over which fireworks may travel by design or accident and upon which firework pollutant waste may fall. It includes the fireworks launching area and adjacent shorelines, quays, docks and the fireworks fallout area.	
Name and License No. of Pyrotechnic Operators	
1.	
2.	

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NPDES NO. CAG999002

3.

Particulars of Display*						Low Level Items*		Ground Displays*	
Shell Size	No. Single Breaks	No. Multi Breaks	Shell Size	No. Single Breaks	No. Multi Breaks	Type	Qty	Type	Qty
25 mm			7"			MINES		SETS	
80 mm			8"			ROMANS		DEVICES	
2"			9"			COMETS			
3"			10"			CAKES			
4"			11"						
5"			12"						
6"									

Net Explosive Weight:

Solid Rocket Motor Gross Weight:

~~Were "environmentally friendly" fireworks used? If so, indicate which fireworks were environmentally friendly.~~

~~Defective Shells - List Manufacturer's Name, Size Of Shell, And Malfunction.~~*

Were the entire firing range (including the fireworks launching area, adjacent shorelines, quays, docks and the fireworks fallout area), barge(s) (if used) and adjacent surface water(s) inspected and cleaned of particulate matter and debris from ignited and un-ignited pyrotechnic material within 24 hours following the display?

☐ Yes Date _____ Time _____

☐ No

If no, explain:

Amount of debris collected from the firing range:_____lbs dry weight

Amount of floating debris collected from adjacent surface water(s):_____lbs wet weight

_____lbs dry weight (if known)

Attachment C – Notification of Fireworks Event (Version 2/7/2011) III-2

Unified Port
of San Diego

3165 Pacific Highway, San Diego, CA 92101
P.O Box 120488, San Diego, CA 92112-0488
619.686.6200 • www.portofsandiego.org

March 7, 2011

Via Hand Delivery

Mr. David W. Gibson
Ms. Michelle Mata
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123-4340

SUBJECT: Comment Letter – 3/11/2011 Board Workshop – Fireworks Draft Permit

Dear Mr. Gibson and Ms. Mata:

The San Diego Unified Port District (Port) thanks you for the opportunity to provide comments on Tentative Order #R9-2011-0022, General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks. We appreciate your office's efforts in working with the numerous stakeholders to obtain input on this important community issue. The Port has reviewed the tentative order and has the following comments at this time. The Port plans to attend the Board Workshop on March 11, 2011, and may offer additional comments at that time.

The Port is concerned that word "sponsor" is overly broad and requests that it be defined. For example, on page 6, Section II.B and throughout the Tentative Order, the document states "When a fireworks event(s) is sponsored by one person but is operated or conducted by another person, it is the sponsor's duty to submit an NOI and obtain coverage under this order." Locally, display "sponsors" are considered individuals or groups that donate funding to those who put on the fireworks shows. Monetary "sponsors," such as the Port and numerous others, have no involvement in or control over the displays and do not "discharge" the fireworks. Therefore, they should not be required to be named on the General Permit and thereby assume legal liability for another party's actions over which they have no control. Should that occur, many monetary sponsors may choose to withdraw their support, which would jeopardize the ability of the shows to continue. Therefore, please either eliminate the word "sponsor" throughout the Tentative Order or clarify that people or groups that merely donate funds to the organizers of fireworks shows need apply for coverage under the Order.

The Port also has the following initial questions and comments on the draft Monitoring and Reporting Program (Attachment E, Section IX) that we expect will be addressed at the Board Workshop on March 11, 2011:

1. Section IX.A.1 defines a Category 1 Discharger, in part, as a discharger of fireworks "containing a net explosive weight of 1,000 pounds or more, . . .", which requires water monitoring. In contrast, in Section IX.B.2, no water monitoring routinely is required for fireworks containing a net explosive weight of less than 1,000 pounds. Please clarify why this distinction was made.

2. Section IX.A.3 requires sediment sampling every three years. Please provide the basis for this requirement, as most long-term monitoring programs evaluate sediment trends using a five-year sampling strategy.

3. Section IX.A.3 also requires the development of a Conceptual Model identifying the physical and chemical factors that control the fate and transport of pollutants and receptors that could be exposed to pollutants in the water and sediment. Please clarify how this model will distinguish the pollutant contributions from fireworks events from historic and legacy conditions and other ongoing sources of pollutants or discharges in the vicinity.

4. In Section IX.A.2, Category 1 Dischargers are encouraged to establish or join monitoring coalitions for San Diego Bay and/or Mission Bay. As you know, these bays have been sampled on regular intervals for the last 15 to 20 years though the Bight Program and Regional Harbor Monitoring Program and as a result, have established a solid baseline of water and sediment conditions. Please clarify how the proposed fireworks monitoring would use the established monitoring information to identify impacts that are specific to fireworks sources.

The Port looks forward to continuing its work with the Regional Board and the numerous stakeholders on these issues. If you have any questions, please contact me at (619) 686-6254.

Sincerely,

Eileen M. Maher
Assistant Director
Environmental & Land Use Management

EMM:rlg
File: Fireworks
cc: Darlene Nicandro
Docs #458059

March 7, 2011

VIA EMAIL AND U.S. MAIL

Michelle Mata
Water Resources Control Engineer
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123
mmata@waterboards.ca.gov

Re: Comments to Draft Tentative Order No. R9-2011-022
Comment Letter-3/11/2011 Board Workshop-Draft Fireworks Permit
Reg Measure 375971: MMATA
Place: 656901

Dear Ms. Mata:

Pyro Spectaculars, Inc., (PSI) submits the following comments to the referenced Draft Tentative Order. These comments address the Fireworks Best Management Practices Plan (BMP's) set forth in Section V., Paragraph B., and proposed for inclusion in the Order.

In particular, PSI's comments focus on the practical aspects of implementing the BMP's in a manner that is consistent with applicable rules, regulations, law and safe handling practices for public fireworks displays. PSI also proposes alternative language for the BMP's that incorporates the practical pyrotechnic considerations offered here but still provides the same level of protection for the environment as the BMP's in the Draft Tentative Order.[1]

Introduction

PSI supports the efforts of the Regional Board in considering the input of the people and organizations that are interested in the development of this permit. Among us are those interested in protecting our water resources, ensuring that our community and public events will continue, and demonstrating our national pride in the traditional way with public displays of fireworks. We do not view these interests as incompatible with each other.

PSI of course has an interest in seeing that public fireworks displays for expressions of national pride and entertainment continue. But we are mindful too of the value to us all of clean water, enthusiastic communities and even spirited debate on such matters.

PSI is a fifth generation family company that has been performing public fireworks displays for more than three decades, including many displays in the San Diego area. The owners and employees of PSI have vast experience in the professional display of fireworks and perform hundreds of displays every year throughout California, the nation and the world.

PSI is committed to the highest possible levels of professional industry participation, and we regularly participate and assist in the development, maintenance and enforcement of state, national and international fireworks standards, laws and regulations. Our employees provide many training sessions each year for our pyrotechnic operators. PSI works directly with the State Fire Marshal's office in the development and presentation of in-service training for hundreds of authorities with jurisdiction over fireworks displays and pyrotechnic special effects.

I am General Counsel for PSI. I have been licensed in California as an attorney since 1979 and for the past fifteen years have focused on the law, safety, regulation and practices of the fireworks industry. I serve on two California State Fire Marshal's Advisory Committees addressing the regulatory needs and requirements for both fireworks and pyrotechnic special effects in California. I am an active participant on the National Fire Protection Association Technical Committee on Pyrotechnics, working in the development and revision of national and international consensus codes and standards that affect fireworks, pyrotechnic special effects, and model and high power rocket motors. I have testified before the United States House of Representatives, Subcommittee on Economic Security, Infrastructure Protection, and Cybersecurity regarding security for transportation of hazardous materials including explosives and fireworks.

In addition, I have been licensed as a California Commercial Pyrotechnic Operator since 1984. I have worked on and served as operator in charge of numerous public fireworks displays including displays from barges. I served on the Task Group of the NFPA Technical Committee on Pyrotechnics that developed the Code for Fireworks Displays Discharged from Floating Vessels and Floating Platforms.

Based on our experience with public fireworks displays, including the applicable rules, regulations, law and safe handling practices, PSI submits the following comments and alternative text for certain of the proposed BMP's.

Comments to Fireworks Best Management Practices Plan

Under Section V., Paragraph B., the permit would normally be issued to the sponsoring person or organization, which would be the permittee or "Discharger" as we understand those terms. That entity would not usually be the fireworks operator actually performing the display, but it could. Because of these potentially multiple parties and/or dual roles, the provisions of Paragraph B seem vague about who is responsible for what under the proposed permit.

Some of the practices set forth in the BMP's would normally be performed by the sponsoring organization[2]. Other responsibilities would normally be performed by the fireworks contractor, some of which require a professional fireworks license. If it is intended that the entity obtaining the permit is responsible for either performing the requirements or ensuring that the requirements are performed by others (for example those with the appropriate licensure) that intention might be more clearly stated in the final permit.

As we address individual paragraphs in the following discussion, we will suggest changing to a more neutral voice on the subject of *who* must do something, and choose instead to specify *what* must be done. This would cause the person or entity obtaining the permit to remain responsible for the necessary elements of the BMP and leave it to them to determine by whom that element would be accomplished, except in the case where licenses are required.

Paragraph 4

Paragraph 4 has several practical difficulties that might best be addressed by reference to compliance with existing laws, regulations and permitting that would affect the display. For ease of reference, Paragraph 4 is discussed in smaller pieces. The centered text is excerpted from the draft Tentative Order, Section V., Paragraph 4. Following the discussion of the text in Paragraph 4, we suggest alternative text.

> If the fireworks are launched or ignited on barges, the barges shall be setup in accordance with the requirements, and under the supervision of the Fire Department having jurisdiction.

There are many requirements for setting up fireworks displays wherever located in California. Few of those requirements flow from local codes or authority. Most of the requirements arise from California state law and regulation, which first provide that the display must be conducted by a licensed pyrotechnic operator, such as PSI, and supervised by a licensed pyrotechnician who is the individual in charge of supervising the setup and discharge of the display. There are often multiple authorities having jurisdiction over such displays and that group may or may not include a "Fire Department" depending upon a number of variables. The Coast Guard is also likely to have jurisdiction in addition to state, county, harbor or city authorities.

> The "mortars" used to hold and launch the fireworks shall be secured properly and use fire-retardant material, such as sand, in accordance with local codes. Barges shall be inspected for leaks and other potential safety issues.

The equipment used in a public fireworks display must meet both installation methods and physical requirements established by the state fireworks laws and regulations, which are at odds with the draft language. For example, wooden racks and mortar boxes would not meet the proposed "fire-retardant" standard proposed in Paragraph 4, yet those materials are required to be used by state fireworks regulations. Sand alone may not be used to stabilize mortars, and there are a number of regulatory, practical and safety considerations in deciding just how to stabilize them. Again, "local codes" rarely have any application to such displays, and for good reason. Statewide uniformity of regulation by authorities having the most experience and knowledge of explosives, fireworks and fireworks displays is of great advantage to the safety and security of the public and its resources.

> As soon as practicable, and no later than 24 hours following a public display of fireworks, the Discharger shall sweep the decks of each barge to prevent debris and other solid waste from blowing into the water.

We certainly agree that we should minimize the debris entering the water following a display. However, we suggest not specifying that the Discharger should be the individual or entity to sweep the decks. This is perhaps a matter best left to those managing a particular display considering any number of matters. Generally the fireworks licensee would perform this responsibility, but not necessarily. Similarly, inspection of the barges (mentioned in the prior paragraph) is best left to those most knowledgeable about such things, and the use of the non-specific requirement in that sentence seems preferable over the Discharger-specific requirement for sweeping.

> The barges shall be returned to the loading or setup area to be further cleaned and to have the mortars removed.

Concluding our look at Paragraph 4, sometimes there are barges, or floating platforms, that remain anchored in position with the mortars set for additional displays, and potentially for safety or other reasons. There also could be barges that return to a different location than the loading or setup area for safety and other considerations as well. The requirements that the barge be returned to a particular location or have the mortars removed would seem to just increase traffic and the risks and burden of handling of the equipment without a clear offsetting benefit.

With these matters in mind, we propose alternative language for Paragraph 4 as follows:

> 4. If the fireworks are launched or ignited on barges or floating platforms, the fireworks and fireworks equipment shall be setup, discharged and taken down in accordance with the laws and regulations applying to that display by a public display fireworks operator licensed in the State of California. All required permits and permissions shall be obtained from the authorities having jurisdiction of the fireworks display, and the parties responsible under applicable law and regulation shall comply with the requirements and conditions of those permits. All equipment used to hold and launch the fireworks shall be secured properly in accordance with applicable laws and regulations and in such a way as to minimize the risk that they would fall into the water. Barges and floating platforms shall be inspected for leaks and other potential safety issues. Other than system firing cables and common or grounding wires intended to be recovered after the display, electric igniter wires used to trigger the fireworks shall be secured to minimize the risk that the wires would fall into the water during or after discharge. As soon as practicable, and no later than 24 hours following a public display of fireworks, the decks of each barge or floating platform that contained fireworks shall be raked or swept to gather fireworks debris and prevent it from being deposited into the water. Sand used to secure fireworks or fireworks equipment need not be swept from the decks.

We think this proposed alternative text for Paragraph 4 fully incorporates the same environmental protections that the Regional Board's proposed Paragraph 4 is intended to provide, while making Paragraph 4 consistent with applicable rules, regulations, law and safe handling practices for public fireworks displays.

Paragraphs 5 and 6

Paragraphs 5 and 6 present some ambiguity in light of the applicable fireworks laws and regulations. As mentioned above, the "Discharger" is not necessarily a licensed fireworks operator, but Paragraph 5 seems to require the Discharger to do things that only a licensed fireworks operator may do. Also, not all material remaining after a display is necessarily waste, let alone hazardous waste. For example, there may be unfired shells after a show that properly are re-packed in Department of Transportation approved boxes and returned to the fireworks display company. Finally, the terms *wholesaler, manufacture, importer, exporter*, and *pyrotechnic operator* all have specific meanings and responsibilities under the fireworks laws. We suggest the following alternative language:

> 5. All hazardous fireworks waste resulting from the setup, firing, and strike of the public display including live pyrotechnic waste shall be handled and managed in accordance with applicable fireworks and hazardous waste laws and regulations.

6. All non-hazardous solid waste resulting from the setup, firing, and strike of the public display, including wires, boxes, and packaging, shall be collected to the extent practicable and properly disposed of.

Paragraph 7

We simply suggest that the word "firing" be added to Paragraph 7 in the list of activities requiring compliance with Titles 19 and 22.

Paragraph 9

Because the permits and licenses enumerated in this paragraph are examples only and do not constitute an exhaustive list, we suggest either changing the "i.e." to "e.g." or removing the examples.

Conclusion

Thank you for the hard work of the Board Staff that drafted the Tentative Order. PSI hopes that you will consider the value of its suggestions as a contribution from the fireworks professionals that will have to understand and comply with the elements of the final BMP's so that public fireworks displays are protective of both public safety and the environment.

I will be in attendance at the March 11 workshop and would be pleased to respond to any questions regarding PSI's proposed revisions to the text for certain of the Draft BMP's.

Respectfully submitted,

PYRO SPECTACULARS, INC.

Gary E. Brown
General Counsel

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[1] PSI does not believe the draft NPDES permit is authorized or required for the reasons set forth in the December 9, 2010 letter from PSI's outside counsel, Brian Zagon, to the Regional Board. PSI continues to reserve its rights on all issues raised in the December 9, 2010 letter, but offers these comments in a spirit of cooperation.

[2] For example, take a look at the third proposed BMP. In actual practice, the range and/or surrounding areas may be cleared of debris either by the sponsor or the fireworks company, or both. However, certain requirements, such has handling "un-ignited pyrotechnic material including aerial shells..." must be performed by a licensed fireworks operator.