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February 12, 2001

James H. Lecky
Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
501 West Ocean Boulevard, Suite 4200
Long Beach, CA 90802-4213

RE: San Onofre Nuclear Generating Station
Small Take Exemption Permit Application

Southern California Edison (SCE), San Diego Gas & Electric Company, the City of Anaheim and the City of Riverside, the owners of San Onofre Nuclear Generating Station (SONGS), hereby submit the enclosed application, pursuant to Section 101(a)(5)(A) of the Marine Mammal Protection Act and in accordance with 50 CFR 216.104. The application requests a small take exemption permit for the potential incidental taking of a small number of pinnipeds, such as harbor seals, California sea lions and northern elephant seals as a result of plant operations.

SONGS generates approximately 2300 megawatts of electrical power for the people of Southern California. As described in the application, the plant draws ocean water through offshore intake structures to provide cooling for the plant's main condenser and other components necessary for the safe and reliable operation of the facility. The cooling water is pumped back to the ocean through discharge structures. The intake structures are located in about 30 feet of water about 3,200 feet offshore from the plant. Small numbers of California sea lions and harbor seals have been found in the station's intake forebays as an apparent result of their entering the intake structure and then being drawn through the intake tunnel. Approximately half of the animals are alive and are released back to the ocean.

Although Units 2 and 3 began commercial operations in 1983 and 1984, respectively, their cooling water systems were placed in service in 1982 and 1983. The intake and discharge structures associated with the cooling water system were specifically designed and located to minimize their environmental impact particularly with respect to thermal discharge and fish entrainment. Since 1978, SONGS has observed and reported to the National Marine Fisheries Service (NMFS), Southwest Region, the entrainment of pinnipeds at the plant.

Incidental takes at SONGS have negligible impact on pinniped stocks and the ability of the pinniped populations to reach and maintain their optimum sustainable levels, and are only a very small fraction of the total number of the

San Onofre Nuclear Generating Station
P. O. Box 128
San Clemente, CA 92674-0128

reported non-natural mortalities that occur annually. SCE currently holds a letter from your agency for the handling of these animals. Nonetheless, SONGS, in consultation with the NMFS Southwest Region, has concluded that it is advisable to submit this application for an exemption from the Marine Mammal Protection Act of February, 1995, for small takes.

If you have any questions on this matter, please contact Mary Jane Johnson at (949) 368-6651 or Robert Heckler at (949) 368-6816.

Sincerely,

Howard W. Newton
Manager, Site Support Services

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IDB / CDM

Southern California Edison

Marine Mammal Protection Act

Small Take Permit

Application

February 12, 2001

Submitted by:

Southern California Edison
San Onofre Nuclear Generating Station
Environmental Protection Group
P.O. Box 128; Bldg. W-44
San Clemente, Ca., 92674-0128

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

Marine Mammal Protection Act
Small Take Exception Permit

APPLICATION

1. A detailed description of the specific activity or class of activities that can be expected to result in incidental takings of marine mammals.

Limited numbers of incidental takings of California sea lions and harbor seals have occurred and are expected to continue as a result of the operation of the San Onofre Nuclear Generating Station (SONGS) cooling water system. Continuous cooling water flow is necessary for the generation of electricity and for the safe operation of the plant. SONGS is a three unit[1] 2300 megawatt nuclear power generating facility located near the California coastal town of San Clemente, which is approximately 45 miles north of San Diego, and 60 miles south of Los Angeles. It is operated by Southern California Edison (SCE) as managing agent for the station's owners.[2] SONGS Units 2 and 3 began commercial operation in 1983 and 1984 respectively, and are expected to operate at least until the year 2022 when SONGS' operating license expires.

Pinniped takes occur when a seal or sea lion enters either of the SONGS cooling water structures located approximately 3200 feet offshore. Some proportion of those pinnipeds entering the intakes become entrapped as the cooling water is drawn through the intake tunnel to the plant. Once the animal enters a tunnel, it is underwater and unable to breathe until it reaches the station forebay. Transit time for water to pass through the pipe is approximately eight minutes. The time for the pinniped to transit the tunnel depends on whether it swims with, or against the current.

Design and History of SONGS' Cooling Water System

As a base load plant, SONGS normally operates at full power unless shut down for scheduled refuelings and maintenance, or for an unscheduled forced outage. During normal power operations, each of the Units 2 and 3 cooling water systems provide about 830,000 gallons per minute (gpm) of ocean cooling water to the station. Most of this water goes to the main condenser via the Circulating Water System (CWS) and the eight CWS pumps. In the main condenser, the

[1] Unit 1 was taken off line in 1992, and is in the process of being decommissioned. No pinnipeds have been entrained via the Unit 1 intake structure since that time. All figures and discussion in this application pertain to the operation of Units 2 and 3 only.

[2] SONGS is owned by SCE (75%) San Diego Gas & Electric Company (20%), Cities of Anaheim and Riverside (5%).

cooling water flows through thousands of condenser tubes and condenses the steam exhaust from the main turbine, which is used to generate the plant's electrical output. A smaller amount of ocean cooling water, about 48,000 gpm, is pumped to various heat exchangers via the Salt Water Cooling System (SWCS) and the 4 SWCS pumps, 2 of which are normally in operation. The SWCS is used to provide cooling water for other plant machinery and heat exchangers, some of which are related to nuclear safety.

The ocean cooling water is drawn into two offshore intake structures, which are located approximately 3,183 feet offshore from the plant (Figure 1). The Unit 2 and Unit 3 intakes are 647 feet apart, and are located in water about 30 feet deep. The intake structures were designed with velocity caps that allow the relatively large volume of ocean water to be drawn in at a relatively low speed of about 1.7 feet per second (1.0 knot). The low intake velocities, as well as the horizontal intake currents provided by the velocity caps, minimize the entrapment of marine organisms.

The intake velocity caps are 49 feet in diameter with seven-foot tall horizontal openings. The bottom of the horizontal intake cap openings are ten feet above the ocean bottom to minimize the entrapment of bottom fish and lobsters. The top of the intake cap opening is about 12 feet below the ocean surface. Each of the two velocity capped intakes draw ocean cooling water inward in a horizontal direction and redirects the flow downward through its respective cooling water intake tunnel.

Once the ocean cooling water enters the intake tunnels, the flow velocity is about 7.3 feet per second during normal plant power operations. It takes approximately 7.9 minutes for water to reach the station forebays once it enters a tunnel.

Both units have diffuser type discharges consisting of 63 ports, each spread over a distance of 2,460 feet. The Unit 2 diffuser begins 5,888 feet offshore and ends 8,350 feet offshore from the screenwell at a depth of 49 feet. The Unit 3 diffuser begins 3,558 feet offshore and extends to 6,020 feet at its terminus in a depth of 38 feet.

The intake tunnels terminate at the plant in a large concrete transition structure called a forebay. The forebay is open to the outside air and serves as a surge chamber for the water entering from the intake tunnel. The intake transition structure is about 18 feet deep and 16 feet by 16 feet across. From the common transition structure, the cooling water is directed to the CWS and the SWCS pumps (Figures 4 and 5), delivering cooling water to the main condenser and other plant heat loads. There are four CWS pumps and four SWCS pumps located within each unit. The forebay area contains traveling screens, which

remove waterborne debris before it enters the pump suction. The CWS forebay is about 26 feet deep and 64 feet across.

Waterborne debris is caught on the upstream side of the traveling screen and carried upward on small shelves attached to the screens as they rotate. As the debris nears the top of screen travel, it is flushed off by high velocity water sprayed from the screen wash nozzles. The debris falls from the screens into a trash trough, which runs the length of the forebay into a collection basket in the fish removal area.

San Onofre Units 2 and 3 are unique among coastal generating stations in that they include a Fish Return System (FRS), which is designed to return entrained fish and other marine organisms back to offshore waters in a viable condition. Studies have proven that the FRS is highly effective, returning approximately 80% of entrained fish back to the ocean. The system functions by guiding fish through the use of vanes and louvers to a fish return elevator. The elevator lifts fish and other marine life in a water filled bucket then empties them into a concrete conduit to be carried back to the ocean. Seals and sea lions that enter the station are similarly guided to the fish return elevator. It is at this location that they are removed from the system.

During licensing of SONGS in the 1960s, the design and environmental impact potential of the station's cooling water system received rigorous regulatory review from the Nuclear Regulatory Commission (NRC). Subsequent reviews conducted by the Environmental Protection Agency (EPA) and the San Diego Regional Water Quality Control Board, determined that the SONGS discharge was in compliance with the 316(a) & (b) requirements of the Clean Water Act. The California Coastal Commission also conducted studies through the Marine Review Committee (MRC). They concluded that the SONGS discharge had significant adverse impacts to the offshore environment. SCE disputed this conclusion but agreed to mitigation measures in accordance with the Coastal Development Permit issued by the Coastal Commission. These agencies concluded that the operation of SONGS would not cause significant adverse effects to the aquatic ecosystems or to commercial and recreational fisheries in the area.

Incidental Takings by Ocean Cooling Water System Intakes

Because of the underwater, offshore location of the intake structures, pinnipeds have not actually been observed entering the intake velocity caps. Since the low horizontal flow velocity of 1.7 feet per second into the intakes is unlikely to be strong enough to draw pinnipeds involuntarily inside the intake structures, SCE believes that the following sequence of events takes place: a seal or sea lion swims into a velocity intake cap either out of curiosity, or in search of or pursuit of prey. Inside the intake velocity cap, the flow rate increases as the animal

approaches the center vertical riser shaft that connects to the intake conduit. This increasing velocity and downward turning flow causes the animal to be drawn into the riser. The downward current is not something they normally encounter in their natural environment. This situation, combined with the lack of light and confinement inside the velocity cap and riser, may disorient the animal and prevents an effective escape response, especially for young-of-the-year, weak, or unhealthy animals. As a result, the animal is unable to exit, and it is drawn into the forebay. In addition, dead animal carcasses drifting in the vicinity of the intake structure are entrained along with other debris and drawn into the forebay. Approximately half of the animals found in the forebay are alive and are successfully released to the ocean. This is accomplished by allowing the animal to climb out of the water into floating cages. These cages are equipped with a treadle that triggers a door which closes, trapping the animal, and enabling SONGS personnel to lift it out of the forebay and release the animal as appropriate. Some animals may drown in transit, being unable to breathe in the intake structure, but SCE cannot document this hypothesis. The carcasses are disposed of in an appropriate landfill, and the live animals are either released on the beach if they are uninjured, or transported to an animal rescue organization (e.g. Friends of the Sea Lion; Sea World).

2. The date(s) and duration of such activity and the specific geographical region where it will occur.

SONGS is a baseload electric generating facility which means that it normally operates continuously at full power. The only routinely scheduled shutdowns are the refueling and maintenance outages which currently occur about every 18 months. The length of SONGS's refueling and maintenance outages have varied from 40 to 120 days. In the last five years, the average outage has lasted 60 days.

Even during shutdowns, however, at least one of the four Main Circulating Water System pumps and one of the four Salt Water Cooling pumps is usually in operation, drawing ocean cooling water in through the offshore intake structures. Operation of the station in this manner is expected to continue at least until SONGS' Operating Licenses, issued by the Nuclear Regulatory Commission, expires in 2022.

As shown in Attachment 1, the location of the two ocean water intake structures where the pinnipeds enter the SONGS cooling water system are approximately 3200 feet offshore. The station is located approximately 60 miles south of Los Angeles, California, in northern San Diego County.

Although pinniped takes occur year-round, there appears to be a seasonal relationship. Table 1 provides the distribution by month of the observations of

the pinnipeds discovered in the station forebays. The records indicate that most entrainment occurs from November through June, with the highest number of animals entrained in April and May.

SONGS has tracked the entrainment rate of marine mammals with changes in environmental factors (see Table 2). The most obvious influence is the occurrence of El Niño/La Niña events. Unusually warm ocean temperatures associated with El Niño events characteristically lead to dramatic increases in mammal entrainment.

Conversely, cool temperature "La Niña" events typically have greatly decreased numbers of entrained animals. This pattern is also observed in records of marine mammal strandings unassociated with power generating stations.

NOAA, in their article "Why Does El Niño Affect Pinnipeds?" (http://nmml01.afsc.noaa.gov/El_nino/whyEl_nino.htm) points out that changes in the health of sea lions appear to be associated with changes in marine mammal prey availability caused by El Niño (EN). With EN comes important changes in oceanographic conditions in California coastal waters. Upwelling, which brings cool, nutrient rich water from the depths into the surface layers, decreases during an EN event, and the mixed layer of the water column becomes much deeper. In response to these changes, marine mammal prey species move northward or deeper in the water column thereby becoming less available to foraging seals and sea lions. Pregnant and lactating females have difficulty finding adequate supplies of food to support healthy pregnancies, and females that are successful in giving birth to pups have difficulty in finding sufficient food to maintain normal production. Consequently, pups grow more slowly and more pups die of starvation and disease.

It is likely that the weakened survivors of EN come closer to shore in search of food and are more likely to encounter the intakes of coastal generating stations. They are also less likely to be strong enough to avoid the intake flow velocities. Since more dead animals are found stranded on beaches during the EN periods, it also seems likely that more dead carcasses are likely to be entrained during this period.

A secondary influence may be the reduction in the size of kelp beds during El Niño events. This may result in the increased use of intake structures for cover by fish that usually use the kelp bed habitat. The increased number of fish around the intakes may attract marine mammals.

Based upon this past history of pinniped takes, together with the growing pinniped population (as discussed in Section 3), SONGS expects that pinniped entrainment rates will continue, especially in the winter and spring months, throughout the plant's operating life.

Table 1.

SONGS UNITS 2/3 PINNIPED ENTRAINMENT RATES FROM 1980 - 1999												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	1	1	0	0	2	0	0	0	0	0	0
1982	0	2	1	2	0	0	0	0	0	0	0	0
1983	0	0	0	2	1	0	0	1	1	1	2	0
1984	0	0	1	0	1	0	0	0	0	0	0	0
1985	0	0	1	0	3	0	1	1	0	0	0	0
1986	0	0	1	3	6	3	0	1	0	0	0	0
1987	1	1	0	4	1	1	1	0	0	0	0	0
1988	0	1	2	0	0	0	0	1	0	2	1	1
1989	2	5	5	3	1	0	0	1	0	1	0	1
1990	1	2	0	3	0	0	0	0	0	0	1	2
1991	5	3	0	4	3	0	0	1	0	1	1	1
1992	2	0	1	5	18	6	0	0	0	2	2	3
1993	1	2	2	2	3	0	0	0	0	0	1	2
1994	3	2	4	3	8	2	0	0	0	1	0	4
1995	0	1	0	6	6	2	2	0	0	1	1	2
1996	2	7	0	11	6	3	3	0	0	0	1	1
1997	5	3	1	5	5	2	0	8	0	2	1	3
1998	8	1	5	15	11	1	2	3	4	2	8	3
1999	2	4	4	4	2	1	0	0	1	1	2	0
5-Year TOTALS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1980 - 1984	0	3	3	4	2	2	0	1	1	1	2	0
1985 - 1989	3	7	9	10	11	4	2	4	0	3	1	2
1990 - 1994	12	9	7	17	32	8	0	1	0	4	5	12
1995 - 1999	17	16	10	41	30	9	7	11	5	6	13	9
20-Yr Grand Total	Jan 32	Feb 35	Mar 29	Apr 72	May 75	Jun 25	Jul 9	Aug 17	Sep 6	Oct 14	Nov 21	Dec 23

3. The species and numbers of marine mammals likely to be found within the activity area.

The marine mammal species affected by the operation of SONGS are the harbor seal (*Phoca vitulina*) and the California sea lion (*Zalcphus californianus*). No other type of pinniped has ever been entrained at SONGS, however, the northern elephant seal (*Mirounga angustirostris*), is known to occur in the area in small numbers.

The populations of these three species have increased dramatically since the passage of the Marine Mammal Protection Act (MMPA) in 1972. NOAA's estimated net productivity rates of these species indicate growth of the populations is continuing (NMFS, 2000). The net productivity rate for California sea lions, calculated for 1980-1999, averaged 16.1% (13.2% if El Niño and El Niño recovery years are removed.) Net productivity rates for the California stock of harbor seals, calculated for 1983-1994, averaged 9.2%. The northern elephant seal has demonstrated population growth rates as high as 16% per year at rookeries in the U.S. from 1959 to 1981 (Cooper and Stewart 1983), but much of this growth was supported by immigration from Mexico. The highest growth rate measured for the whole U.S./Mexico population was 8.3% between 1965 and 1977 (Cooper and Stewart, 1983). A continuous growth rate of 8.3% is consistent with an increase from approximately 100 animals in 1900 to the current population size. The "maximum estimated net productivity rate" as defined in the Marine Mammal Protection Act would therefore be 8.3% (NMFS, 2000).

POPULATION ESTIMATES

California Sea Lions (*Zalophus californianus californianus*): U.S. Stock

The entire population cannot be counted because all age and sex classes are never ashore at the same time. In lieu of counting all sea lions, pups are counted during the breeding season (because this is the only age class that is ashore in its entirety), and the number of births is estimated from the pup count. The size of the population is then estimated from the number of births and the proportion of pups in the population.

Censuses are conducted in July after all pups have been born. To estimate the number of pups born, the pup count in 1999 (42,388) was adjusted for an estimated 15% pre-census mortality (Boveng 1988; Lowry et al. 1992; NMFS, 2000), giving an estimated 48,746 live births in the population. The fraction of newborn pups in the population (22.8% to 23.9%) was estimated from a life table derived for the northern fur seal (*Callorhinus ursinus*) (Boveng 1988, Lowry et al. 1992), which was modified to account for the growth rate of this California

sea lion population (5.0% to 6.2% yr^{-1}, respectively). Multiplying the number of pups born by the inverse of these fractions (4.39 to 4.19) results in population estimates ranging from 214,000 to 204,000 (NMFS, 2000).

Harbor Seals (*Phoca vitulina richardsi*): California Stock

Unlike California sea lion pups, harbor seal pups enter the water almost immediately after birth. Harbor seal populations are estimated by counting the number of seals on land during the peak haulout period from May through June. Using correction factors to account for the proportion of seals that are hauled out at the time of the census (NMFS, 2000), an estimate of the total population can be made. The last estimate to be made was in May/June 1995, resulting in an estimate of 30,293 harbor seals in California.

Northern Elephant Seal (*Mirounga angustirostris*): California Breeding Stock

A complete population count of elephant seals is not possible because all age classes are not ashore at the same time. Elephant seal population size is typically estimated by counting the number of pups produced and multiplying by the inverse of the expected ratio of pups to total animals (McCann 1985). Stewart et al. (1994) used McCann's multiplier of 4.5 to extrapolate from 28,164 pups to a population estimate of 127,000 elephant seals in the U.S. and Mexico in 1991. The multiplier of 4.5 was based on a non-growing population. Boveng (1988) and Barlow et al. (1993) argue that a multiplier of 3.5 is more appropriate for a rapidly growing population such as the California stock of elephant seals. Based on the estimated 24,000 pups born in California in 1994-96 and this 3.5 multiplier, the California stock was approximately 84,000 in 1996.

4. A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities.

All three species of pinnipeds likely to be affected by the operation of SONGS' cooling water system are protected under the Marine Mammal Protection Act. None are afforded threatened or endangered status under the Endangered Species Act, and none are considered "strategic stock"; that is, stock of which the estimated incidental fisheries mortality is greater than the potential biological removal (see Section 7)

The National Marine Fisheries Service (NMFS, 2000) describes California sea lion, harbor seal, and northern elephant seal stock definitions and geographic ranges as follows

CALIFORNIA SEA LION (*Zalophus californianus californianus*): U.S. Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The California sea lion *Zalophus californianus* includes three subspecies: *Z. c. wollebaeki* (on the Galapagos Islands), *Z. c. japonicus* (in Japan, but now thought to be extinct), and *Z. c. californianus* (found from southern Mexico to southwestern Canada; herein referred to as the California sea lion). The breeding areas of the California sea lion are on islands located in southern California, western Baja California, and the Gulf of California. These three geographic regions are used to separate this subspecies into three stocks: (1) the United States stock begins at the U.S./Mexico border and extends northward into Canada; (2) the Western Baja California stock extends from the U.S./Mexico border to the southern tip of the Baja California Peninsula; and (3) the Gulf of California stock which includes the Gulf of California from the southern tip of the Baja California Peninsula and across to the mainland and extends to southern Mexico. Some movement has been documented between these geographic stocks, but rookeries in the United States are widely separated from the major rookeries of western Baja California, Mexico. Genetic differences have been found between the U.S. stock and the Gulf of California stock. There are no international agreements for joint management of California sea lions between the U.S., Mexico, and Canada.

HARBOR SEAL (*Phoca vitulina richardsi*): California Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Harbor seals are widely distributed in the North Atlantic and North Pacific. Two subspecies exist in the Pacific: *P. v. stejnergeri* in the western North Pacific, near Japan, and *P. v. richardsi* in the eastern North Pacific. The latter subspecies inhabits near-shore coastal and estuarine areas from Baja California, Mexico, to the Pribiolof Islands in Alaska. These seals do not make extensive pelagic migrations, but do travel 300-500 km on occasion to find food or suitable breeding areas. In California, approximately 400-500 harbor seal haulout sites are widely distributed along the mainland and on offshore islands, including intertidal sandbars, rocky shores and beaches.

Within the subspecies *P. v. richardsi*, abundant evidence of geographic structure comes from differences in mitochondrial pupping dates, pollutant loads, pelage coloration and movement patterns. [A study in 1996] identified four discrete subpopulation differences in mtDNA between harbor seals from Washington (two locations), Oregon, and California. Another mtDNA study supported the existence of three separate groups of harbor seals between Vancouver Island and southeastern Alaska. Although we know that geographic structure exists along an almost continuous distribution of harbor seals from California to Alaska,

stock boundaries are difficult to draw because any rigid line is (to a greater or lesser extent) arbitrary from a biological perspective. Nonetheless, failure to recognize geographic structure by defining management stocks can lead to depletion of local populations. Previous assessments of the status of harbor seals have recognized 3 stocks along the west cost of the continental U.S.: 1) California, 2) Oregon and Washington out coast waters, and 3) inland waters of Washington. Although the need for stock boundaries for management is real and is supported by biological information, the exact placement of a boundary between California and Oregon was largely a political/jurisdictional convenience. A small number of harbor seals also occur along the west coast of Baja California, but they are not considered to be a part of the California stock because no international agreements exist for the joint management of this species by the U.S. and Mexico. Lacking any new information on which to base a revised boundary, the harbor seals of California will be again treated as a separate stock in this report. Other Marine Mammal Protection Act (MMPA) stock assessment reports cover the five other stocks that are recognized along the U.S. West Coast: Oregon/Washington out coastal waters, Washington inland waters, and three stocks in Alaska coastal and inland waters.

NORTHERN ELEPHANT SEAL (Mirounga angustirostris): California Breeding Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Northern elephant seals breed and give birth in California (U.S.) and Baja California (Mexico), primarily on offshore islands (Stewart et al. 1994), from December to March (Stewart and Huber, 1993). Males feed near the eastern Aleutian Islands and in the Gulf of Alaska, and females feed further south, south of 45° N (Stewart and Huber 1993; Le Boeuf et al. 1993). Adults return to land between March and August to molt, with males returning later than females. Adults return to their feeding areas again between their spring/summer molting and their winter breeding seasons.

Populations of northern elephant seals in the U.S. and Mexico were all originally derived from a few tens or a few hundreds of individuals surviving in Mexico after being nearly hunted to extinction (Stewart et al., 1994). Given the very recent derivation of most rookeries, no genetic differentiation would be expected. Although movement and genetic exchange continues between rookeries, most elephant seals return to their natal rookeries when they start breeding (Huber et al. 1991). The California breeding population is now demographically isolated from the Baja California population. No international agreements exist for the joint management of this species by the U.S. and Mexico. The California breeding population is considered here to be a separate stock.

No northern elephant seals have been taken at SONGS, but the potential for taking exists.

5. The type of incidental taking authorization that is being requested (i.e. takes by harassment only; takes by harassment, injury and/or death) and the method of incidental taking.

The incidental take at SONGS is a result of seals and sea lions inadvertently entering the cooling water system of the generating station. Because of this inadvertent take, SONGS requests a Small Take Permit for takes by harassment, injury and death. Table 4, below, sets forth the condition of the pinnipeds entrained at SONGS from 1988 through 1996 when SONGS documentation included such information.

Harassment: Pinnipeds enter the intake tunnels as described in Section 1, above, and are discovered by SONGS personnel in the forebay inside the plant. From there the animals are captured in a cage and released directly to the ocean.

Injury: Pinnipeds are sometimes found injured in the forebay. Often the type of injury is such that it could not have been caused by the intake tunnel (e.g. gunshot, punctures, fish hooks, and major lacerations). Sometimes it cannot be determined whether an injury has been caused by the intake tunnel or external sources. On very few occasions, it is possible that an injury was caused at least in part by the tunnel (e.g. physical exhaustion). Injured animals are turned over to one of several animal rescue organizations (e.g. Friends of Sea Lions; Seaworld) for veterinary care.

Death: About 50 percent of the pinnipeds entrained in the SONGS holding area are found dead. Some carcasses appear fresh, indicating that the pinniped may have drowned during its swim through the tunnel. However, the exact cause of death cannot be determined unless there are clear and obvious signs of external trauma indicating that the animal was injured or dead prior to being drawn into the tunnel. Where there are no external signs of the animal's cause of death, it is uncertain whether it died from drowning, or in conjunction with prior contributing factors received before entering the SONGS intake tunnels.

In the years 1988 through 1996, SONGS personnel documented the condition of the animals discovered in the holding area. In each year there were many more "fresh dead" than "dead / long dead" animals. It should be noted that these terms are relative and subjective. The term "Fresh dead" includes animals that may have been dead for days. "Long Dead" refers to animals that may have been dead for weeks. "Dead" is a general term used when the observer is unsure of the length of time the animal has been dead.

While the fresh dead may have died during the trip through the intake tunnel, SONGS has never documented injuries / apparent causes of death of the fresh dead animals, other than external trauma. Therefore, it is impossible to determine how many deaths were due to physical injuries sustained while inside the intake tunnel, exhaustion or drowning. Nor can it be determined whether the animals were already dead when entrained or died in transit because of disease or other lethal injuries received prior to entering the intake.

Of the injured pinnipeds released to outside rescue organizations, three could not have sustained their injuries from the intake tunnels (1989, 1994 and 1995); three cases of injuries may or may not have been sustained while the animal was in the tunnel; and one, a case of exhaustion, is assumed to have been caused by the experience in the intake system (1993).

HEAT TREATMENTS

Heat treatments of the circulating water intake are conducted approximately every 6 to 10 weeks on each unit. These heat treatments are performed to control the growth of fouling organisms, especially mussels and barnacles, within the main circulating water system. Prior to the heat treatment, a fish chase procedure is conducted to reduce the amount of fish loss during the heat treatment that follows. During this procedure, the circulating water is heated slowly (approximately 0.5 degrees F/minute), to drive the fish and other marine life to the fish holding chamber where they are removed by a fish elevator and returned unharmed through the fish return line to the ocean. The circulating water intake is heated up to 86 or 87 degrees F during this process.

If a seal or sealion is discovered in the intake prior to or during this process, a seal cage is lowered into the fish holding chamber to facilitate the removal of the marine mammal. In most cases, the marine mammal enters the seal cage and is removed from the station and released unharmed to a nearby beach. If the seal or sea lion does not enter the cage during the fish chase procedure, the cage remains in the fish holding chamber. The heat treatment then commences.

During the heat treatment, the temperature in the circulating water intake is raised to roughly 103 degrees F for about an hour. During this time, the marine mammal usually enters the cage and is removed from the station and released unharmed to a nearby beach. If the marine mammal does not enter the seal cage during the heat treatment, other measures are taken to facilitate the comfort of the animal such as raising the fish elevator with the seal in it, thus keeping the animal out of the intake when it is being heat treated. The marine mammal can also be kept cool by hosing it down with cold water from above. Some marine mammals have also been known to "haul out" onto ledges within the circulating water system to escape the warm water.

To date, no animal is known to have died from this process. However, the possibility always exists that the animal may die based on the combination of the stress of the heat treatment and existing pre-conditions to the animal.

Table 2.

Condition of pinnipeds entrained at SONGS from 1988 - 1996

	Unharmed Released to the ocean	Injured Released to a rescue organization	Fresh Dead	Long Dead	Dead (unspecified condition of carcass)
1988	3	0	3	0	2
1989	5	3 -fishhook -superficial injuries -cut on flipper	6	1	4
1990	3	2	3	1	0
1991	12	0	7	0	0
1992	12	0	26	1	0
1993	6	1 -exhaustion	6	2	0
1994	13	1 -possible gunshot wound and bite	13	0	0
1995	9	1 -eye punctured & bleeding	10	1	0
1996	12	0	23	1	0
TOTALS	**Uninjured & Released** **75**	**Injured & Released** **8**	**Fresh Dead** **88**	**Long Dead** **7**	**Dead (unspecified)** **6**
		Total Alive: 83			
		Total Dead: 101			

6. **By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in paragraph (a)(5) *(Section 5)* of this section, and the number of times such takings by each type of taking are likely to occur.**

Incidental takes of California sea lions, harbor seals and northern elephant seals, by harassment, injury and death, are anticipated to occur as a result of the operation of the SONGS cooling water system.

Based on historical seal and sea lion entrapment at SONGS, it is anticipated that most takes are likely to be young-of-the-year harbor seals and sea lions with less frequent takes of northern elephant seals.

Harbor Seals

Since 1978, the annual number of harbor seals occurring at SONGS has varied from a minimum of 0, in 1980, to a maximum of 27 in 1998 (Table 3). The numbers have gradually increased proportionally with the size of the California stock but demonstrating marked increases corresponding to El Niño events and decreases during La Niña (cool water) events. Thirty-eight percent of the harbor seals have been found dead while 62% have been found alive and were returned to the ocean.

In future years, the number of takes of harbor seals may continue to increase in proportion to increases in the harbor seal population in the area near SONGS. The number of takes can also be expected to increase during future El Niño events.

Table 3. Harbor Seal Entrainment at SONGS Units 1, 2 & 3

Year	Dead	Alive	Total	Year	Dead	Alive	Total
78	1	0	1	90	0	3	3
79	0	1	1	91	6	10	16
80	0	0	0	92	9	5	14
81	2	1	3	93	3	6	9
82	0	1	1	94	4	11	15
83	1	0	1	95	2	6	8
84	0	1	1	96	3	9	12
85	1	1	2	97	2	7	9
86	4	4	8	98	11	16	27
87	0	0	0	99	6	10	16
88	1	4	5	00	3	4	7
89	5	5	10	Total	64	105	169
					38%	62%	

10 yr Average 4.9 8.4

California Sea Lion

Since 1978, the annual number of California sea lions occurring at SONGS has varied from a minimum of 0, in 1979 and 1980, to a maximum of 37 in 1998 (Table 6). The numbers have gradually increased proportionally with the size of the U.S. stock. There have also been marked increases during El Niño events, especially in dead animals, and decreases during La Niña (cool water) events. Seventy-one percent of the sea lions have been found dead while 29% have been found alive and were returned to the ocean.

In future years, the number of takes of sea lions may continue to increase in proportion to increases in the California sea lion population in the area near SONGS. The number of takes can also be expected to increase during future El Niño events.

Table 4. California Sea Lion Entrainment at SONGS Units 1, 2, & 3

Year	Dead	Alive	Total	Year	Dead	Alive	Total
78	1	0	1	90	4	2	6
79	0	0	0	91	4	2	6
80	0	0	0	92	22	7	29
81	0	3	3	93	4	1	5
82	2	4	6	94	9	3	12
83	4	4	8	95	9	4	13
84	1	1	2	96	20	3	23
85	4	0	4	97	11	6	17
86	5	1	6	98	26	11	37
87	8	2	10	99	4	2	6
88	4	1	5	00	5	3	8
89	6	3	9	Total	153	63	216
					71%	29%	
				91-00	11.4	4.2	

Northern Elephant Seals

No northern elephant seals have been entrained at SONGS to-date. Since SONGS is located within the geographic range of this species, and strandings have occurred in the general vicinity of SONGS, it is anticipated that northern elephant seals could become entrapped in the SONGS cooling water intake structures in the future.

7. The anticipated impact of the activity upon the species or stock of marine mammal.

The pinnipeds taken at SONGS include California sea lion, harbor seal and potential for northern elephant seals. The populations of all these species are increasing. The continued operation of SONGS will have a negligible effect on the population of the stocks of these species.

The Marine Mammal Protection Act requires the National Marine Fisheries Service (NMFS) to produce stock assessment reports for all marine mammal stocks in waters within the U.S. Exclusive Economic Zone. As part of that assessment, NMFS is required to estimate the potential biological removal (PBR) for each stock of a species. The PBR is the maximum number of marine animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing the stock to reach or maintain its optimum sustainable population (OSP). If the number of animals removed from the stock exceeds the PBR, the stock is declared "strategic" and additional conservation measures are initiated. If the number removed is less than PBR, the stock is considered to be within the range of its OSP.

The January, 2000 Draft U.S. Pacific Marine Mammal Stock Assessment determines the PBR[3] of California seal lions, harbor seals, and northern elephant seals existing along the California coast to be 6,591, 1,678, and 2,142, respectively. The latest studies estimate that in 1999, 1,272 California sea lions were taken by non-natural means. There are no reasonably accurate estimates for the number of harbor seals taken by non-natural means between 1991 and the present. However, the 2000 Draft MMSA reports that "There are no known habitat issues that are of particular concern for this stock."

The number of takings relative to the estimated populations during the last 20 years is negligible. Twenty-six California seal lions were taken at SONGS in 1998. This is less than 0.5% of the total take and less than 0.1% of the 1998 PBR. Eleven harbor seals were taken at SONGS in 1998, which is less than 0.5% of the PBR. An additional take from these two sources does not change the status nor impact either stock significantly.

The PBR for northern elephant seal (California breeding stock) is 2,142 animals per year. Although no recorded takes of this species have occurred at the SONGS, continued population increases of this species in southern California waters could increase the likelihood of elephant seal entrainments in the cooling water system of the generating station in the future. Estimated annual fishery-related takes are estimated between 33 and 100 individuals per year (1.5% to

[3] There has been no new PBR figure for harbor seals published since 1996.

4.7% of the PBR, respectively), while there were 9 non-fishery-related takes (8 lethal) from 1995 through 1998. Therefore, any incidental take from the generating station, combined with these incidental takes, would be considered insignificant.

Table 5. SONGS takings as a percentage of the total pinniped population.

	Ave. / Year Last 5 Yrs.	Ave. / Year Last 10 Yrs.	Ave. / Year Last 15 Yrs.	Ave./Year Last 20 Yrs.
Sea lion population	163,917	144,633	125,352	111,888
SONGS takings	14	14	11.6	9.4
Percent of population taken	.0085%	.0095%	.009%	.008%
Harbor seal population	32,000	30,304	28,331	24,934
SONGS takings	14	13.4	10.3	8
Percent of population taken	.044%	.035%	.035%	0.32%

8. The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses.

SONGS will have a negligible impact on the availability of harbor seals and California sea lions for subsistence uses. First, only certain Northwest American Indian tribes may, in the future, be entitled to take these animals for subsistence uses (see DRAFT January, 2000 MMSA, pp. 5–6). These tribes presumably make up a very small segment of the human population in the Northwest of the United States, and therefore, given the healthy population of pinnipeds along the Western Coast of North America, the impact on these tribes cannot be significant. Humans are otherwise prohibited from taking these animals for subsistence uses. Therefore, a take at SONGS should not influence the stock in the Northwest.

Second, as illustrated in Section 7, the percentage of the Harbor Seal stock taken by SONGS is less than 0.04%, or 1/250th of the total population. The percentage of California Sea Lions taken is less than 0.01%, or 1/1,000th of the total population. Therefore, any subsistent use of these pinnipeds will not be affected by SONGS' entrainment of California sea lions and harbor seals.

9. The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat.

The continued operation of SONGS will have negligible impact on the habitat of pinnipeds. The anticipated impact of SONGS Units 2 and 3, including its cooling water system (CWS), on the environment was thoroughly evaluated by the

Nuclear Regulatory Commission in accordance with the requirements of the National Environmental Policy Act during the review of the Units 2/3 construction permit application. The operation of the CWS has been approved in accordance with the National Pollutant Discharge Elimination System (NPDES) permit issued by the San Diego Regional Water Quality Control Board.

There are no SONGS activities planned for the offshore area other than the continued operation of the CWS. Thus, potential seal habitat impacts are limited to those associated with the physical presence of the intake and discharge structures and the effects of operating the CWS.

The operation of SONGS has not influenced the habitat of pinnipeds because the area in the vicinity of the SONGS intakes and discharges continues to contain populations or communities of organisms, including shellfish and fish, characterized by diversity and the presence of necessary food chain species. However, the presence of the intake and discharge structures does provide habitat for fish and macroinvertebrates that might not normally be found near these areas. These fish and invertebrates are prey items for seals and sea lions and may therefore provide foraging opportunities to these animals.

The discharge of heated effluent has had no apparent effect on seal habitat. Typically, the monthly average increase in surface water temperature at the discharge is less than 3° F beyond 1000 feet of the discharge. This heated discharge water does not extend to the intake structures and therefore does not modify pinniped behavior near the intakes. The plant has been in compliance with the NPDES permit. After the plant reaches the end of its anticipated operating life it will be decommissioned, and the intakes will be capped, removed, or otherwise disposed of. At that point, there will be no further discharge of heated effluent.

The operation of SONGS requires the presence of intake structures to provide cooling water, which could be considered a habitat modification. Three intake structures are located in about 30 feet of water and rise approximately 17 feet into the water column (see Section 1 for further details). These structures provide the entry point for pinnipeds to the CWS of the plant. The pinnipeds that become entrapped appear to be primarily naïve young-of-the-year animals which are not able to swim back out either due to disorientation, the increased flow velocity in the riser shafts, the confinement of the structure, the lack of light in the intake or a combination of these factors.

In summary, the discharge structures have had no discernible impact upon the habitat of pinnipeds. The only discernible impact that the intake structures have had on the animals is the incidental takes of individual California sea lions and harbor seals. With respect to restoration, both the intake and discharge structures will be capped, removed, or otherwise appropriately disposed of as

part of ultimate plant decommissioning so that pinnipeds, fish and divers cannot enter.

10. The anticipated impact of the loss or modification of the habitat of the marine mammal populations involved.

The continued operation of SONGS and its cooling water system has had a negligible impact on the habitat of pinnipeds as discussed below.

Any changes in the offshore environment, as a result of the SONGS discharge, is not significant on the habitat of the pinnipeds.

As discussed in Section 9, the continued presence of the intake structures does not entail any discernible modification of the habitat of seals, although the intake structures do provide the entrance point to the CWS where pinniped mortality has occurred. Pinnipeds, at least adults, do not appear to be involuntarily swept into the intakes. The water current velocity of 1.7 ft / sec at the entrance to the intakes is less than the 8 to 16 ft / sec measured swimming speed of adult pinnipeds. (Bonner 1990; Stirling, I. 1971).

In addition, the growth of organisms on the intake structure does not appear to be encouraging the development of a significant fouling community that would attract pinnipeds. The intakes are cleaned periodically by divers in accordance with Station procedures.

As discussed previously, the presence of the intake and discharge structures does provide habitat for fish and macroinvertebrates that might not normally be found near these areas. These fish and invertebrates are prey items for seals and sea lions. The intake structure is a point of entry to the cooling water system where pinniped takes have occurred.

11. The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating ground, and other areas of similar significance.

SONGS is exploring options to effect the least practicable adverse impact upon the affected species and will continue to investigate alternative means to deter pinnipeds from entering the SONGS cooling water intakes and to optimize safe and rapid release of animals that enter the station. SONGS has reviewed numerous possibilities and evaluated each against a set of acceptance criteria.

Some alternatives have been eliminated by this process while others have been incorporated at the station or are being given further consideration.

11.1 Introduction

SONGS' efforts to effect the least practicable adverse impact upon the affected pinniped species are of two general types: 1) prevention or reduction of entrainment; and 2) protection of animals that enter the station.

11.2 Prevention/Reduction of Entrainment

To prevent or reduce the number of pinnipeds entering the intake structures and possibly being entrapped by the cooling water system (CWS) would require either a physical barrier or some means of discouraging their presence in the vicinity. As described in Section 7 of this permit application, there are no adverse impacts from the plant to the pinniped populations or stocks as a whole, which continue to grow (NMFS, 2000). There is also no impact to the pinniped habitat other than the direct taking itself, nor is there subsistence use in this region. Most pinnipeds which are affected are young-of-the-year (see Section 6).

With no significant projected impacts from SONGS' pinniped takes to the population or any sensitive areas, the primary remaining goal is to evaluate possible installations to reduce mammal entrainment and determine if methods exist that are feasible for installation. Feasibility must take into consideration impacts on generating station operation and reliability, safety of workers and the local community, protection of marine resources other than pinnipeds, and economic considerations.

The effort to determine the best method of reducing or preventing pinnipeds from being entrapped by the CWS has entailed: 1) development of a list of possible measures; 2) preliminary screening of those measures; and 3) a more detailed evaluation of the most promising options.

The remainder of this section presents the preliminary screening process, criteria, and results (Subsection 11.2.2), a brief discussion of the alternatives eliminated from further consideration (Subsection 11.2.3), and evaluation of the alternatives retained for further analysis (Subsection 11.2.4).

11.2.1 Preliminary Screening of Alternatives

SCE, working in conjunction with the Seabrook Station in New Hampshire, and other utilities cooperatively developed a resource list of possible technologies or measures to minimize pinniped takings. SCE then screened these technologies or measures using a set of acceptance criteria that took into account environmental and operating differences between the two stations. Technologies or measures passing the initial screening process were carried forward if they either met all screening criteria or had promise but required further information to complete the evaluation.

11.2.2 Preliminary Screening Criteria and Process

A list of possible alternative means of minimizing the incidental taking of pinnipeds during operation of the CWS was developed through a literature search, internal discussions, and contacts with a number of individuals including: biologists with expertise in the area of pinniped behavior and population dynamics; individuals familiar with techniques or technologies used to deter pinniped predation in aquaculture; oceanographers and ocean engineers with expertise and familiarity with coastal ocean dynamics and offshore structural design and maintenance; and others with specialized knowledge that might be applicable. Many of the alternatives resulted from a seal deterrent workshop held in New Hampshire in January 1999 at the Seabrook Station.

11.2.3 Preliminary Screening Evaluation

Many initially proposed alternatives were eliminated from further consideration on the basis of significant flaws pointed out by experts in the field of marine mammal biology, ocean engineering and station operations. The technologies or measures considered are listed in Table 6 along with a synopsis of their assessment versus the evaluation criteria.

Table 6. Technologies eliminated from further consideration

Technology	Reason for Elimination
Bubble curtain around intake	Would attract more seals/sea lions to intake.
Escape hatch in intake	Would adversely effect station flow and entrain more fish and invertebrates.
Strobe and other types of lights to "scare" seals and sea lions	Would likely attract fish and other organisms. May attract more marine mammals.
Maze of bars on intake	Clogging highly likely.
Net covering entire intake	Clogging highly likely.
Turning turbine inside intake to "scare" seals/sea lions	Would more likely attract curious seals/sea lions. Reduced cooling water supply to station.
Flexible triangles around intake opening to mimic teeth, deter seals/sea lions from entering.	Not likely to have deterrent effect. Would reduce cooling water flow.
Dangling chains around intake to give visual cue of danger.	Would probably attract curious seals and sea lions to intake.
Bars or cage around intake structure with spacing small enough, (about 4 to 6 inches), that marine mammals could not enter.	Danger of clogging presents nuclear safety concerns. Cost benefit analysis must be taken into consideration.

The following alternative was also considered during the initial screening. While serious concerns were identified, it was nevertheless retained for further consideration.

Table 7. Technology retained for further consideration.

Technology	Comments
Acoustic Deterrent Device (ADD)	Harmful to marine mammals and other sealife. Installation difficult to impossible. Cost may be much greater than benefit.

11.2.4 Alternative Retained For Further Analysis

While there are serious concerns that must be addressed, acoustic deterrent devices (ADDs), may be further considered in the future.

- **Acoustic Deterrent Devices (ADDs).** Underwater sound emitting devices have been in experimentation or use since the early 1980s, especially to deter seals and sea lions from salmon aquaculture net pens in coastal waters (Mate and Harvey 1987; Morris 1996; NMFS 1996). One system that has been developed and tested beginning in 1993 is the AIRMAR "dB plus" system. As one of a new generation of more powerful ADDs (Norberg and Bain, 1994), it transmits at a frequency and sound level that is painful to harbor seals at approximately 150 feet from system sound projectors. Some success has been reported but there have also been anecdotal evidence that some animals are willing to endure the pain of the system, in some cases by raising their heads above water, to reach the protected fish. Some biologists have expressed concern that the animals are subjected to this painful stimulus and may suffer permanent damage to their hearing. Other environmental concerns include long-range attraction of marine organisms, including fish and other species of marine mammals that are not currently found near the intakes. There could also be impacts on fish eggs and larvae by the low frequency sound waves and impacts on human divers in the vicinity of the devices.

In addition, there are practical concerns regarding the installation of ADDs at SONGS that include the feasibility of supplying electricity to an offshore, underwater, installation and the costs and dangers associated with such an installation. Finally, permanent injury to the animal's hearing is a concern of the environmental community.

11.3 Protection of animals that enter the station.

As mentioned earlier, approximately half of the pinnipeds that enter the SONGS intake systems are found alive. SONGS has developed procedures and mechanisms to rescue these animals and return them to the ocean unharmed. Healthy animals are released immediately, while animals that

are malnourished or are injured are sent to marine mammal care centers where they receive veterinary care before being released back to the ocean. The following is a list of steps SONGS has previously taken to improve the efficiency of marine mammal releases:

- On-site fire department/paramedics given responsibility to rescue and return live mammals to ocean on a 24-hour, seven-days-per-week schedule.
- SONGS Emergency Preparedness develops methods to use cargo nets for capture of live marine mammals.
- Environmental Affairs provides training to SONGS firefighters in identification, rescue, and handling of marine mammals.
- SCE obtains Letter of Authorization from National Marine Fisheries Service to take and handle marine mammals.
- Prototype seal capture cage tested at SONGS.
- Near-shore bell buoys removed to avoid attractive haul-out opportunities for sea lions near SONGS intakes
- Improved self-closing, lightweight seal cages designed and constructed by SCE R&D at cost of $35,000. Three cages permanently assigned to SONGS for faster response.
- Signs posted at screenwells instructing all personnel to report any observations of marine mammals immediately to Emergency Preparedness so that rescues can be quickly effected.
- Polished stainless steel "mirror" in back of seal cage tested to see if animals would enter more quickly. No significant change found.
- Improved reporting forms and procedures for both live and dead marine mammals developed for Operations personnel.
- Training in marine mammal identification and reporting presented to SONGS Operations personnel.

SONGS will continue to review and evaluate ways to improve mammal releases.

12. Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or affect the availability of a species or stock of mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses.

The activity does not take place in or near a traditional Arctic subsistence hunting area and does not affect the availability of a species or stock of mammal for Arctic subsistence uses.

13. The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting the activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

13.1 Current Practices

The pinniped monitoring activities at SONGS consist of an in-plant program to detect and report the entrainment of all pinnipeds. Screen wash debris is inspected and assessed by plant operators for evidence of pinniped remains. In addition, daily visual inspections of the water surface in SONGS' Circulation Water System (CWS) and Fish Return System are performed by SONGS operations department staff. The gate slots are also inspected for pinnipeds that may have hauled out to rest upon ledges within the system. Live pinnipeds are encouraged to climb out of the water into floating cages. These cages are equipped with a treadle that triggers a door which closes, trapping the animal, and enabling SONGS personnel to lift it out of the tank and release the animal as appropriate. Signs are posted near the Circulating Water System to encourage workers to quickly report any sighting of animals in the station.

Pinniped carcasses are documented as to species and disposed of in the local landfill. Full reports of all marine mammals found at the station are reported to the National Marine Fisheries Service, Southwest Division, on a monthly basis.

Live pinnipeds are inspected for obvious injury. Non-injured animals are normally released on the beach, while those injured are released to one of several animal rescue organizations (e.g. Friends of the Sea Lion; Seaworld). The physical condition and mode of release is documented and forwarded on to the National Marine Fisheries Service, Southwest Division, on a monthly basis.

During refueling outages, the forebays are inspected and any indication of pinniped remains or presence are documented and reported.

SONGS personnel do not include the pinniped's age, sex or reproductive condition in their reports, since these parameters are usually difficult to discern.

13.2 Implementation of Revised Documentation Practices

SONGS is currently in the process of revising its guidelines for personnel having direct contact with the pinnipeds. The revised guidelines will include direction to complete a "Marine Mammal Stranding Report" (a blank copy of which is attached). Recording and reporting more specific information on the pinnipeds entrained at SONGS will therefore be more consistent

13.3 Impact of Revised Documentation Practices

13.3.1 -upon pinniped population and rate of entrainment at SONGS.

Creating a more complete and consistent record of the pinnipeds entrained at SONGS will likely have no impact upon the number of takings, however, general knowledge of the animals taken will be increased and the data may be useful to educational and research organizations.

13.3.2 -upon SONGS personnel workload

Currently, the SONGS personnel having direct contact with the animals note in an entrainment log very basic information on the animals. SCE corporate personnel then transfer that information

onto the MMS Report, and submit it to the NMFS. Under the revised guidelines described in Point 13.2, above, the MMS Report will be completed by SONGS personnel in place of the logbook. An increase in the detail of the records made will have some practical impact upon their workload. However, the burden of SCE corporate personnel will be minimized, as they will be responsible only for reviewing the form for completeness and submitting it to the NMFS, rather than duplicating the documentation of SONGS personnel.

SCE has furnished its records to the NMFS on a regular basis for many years, so continuing to do so will have no impact in this regard.

14. Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

As discussed in Point 11, above, SONGS is continuing to explore various methods of reducing its take of pinnipeds. SONGS will evaluate the effectiveness of acoustic devices based on on-going studies by the NMFS. In plant mammal rescue and detection, devices will be coordinated through NMFS and other experts in the field of marine mammal behavior.

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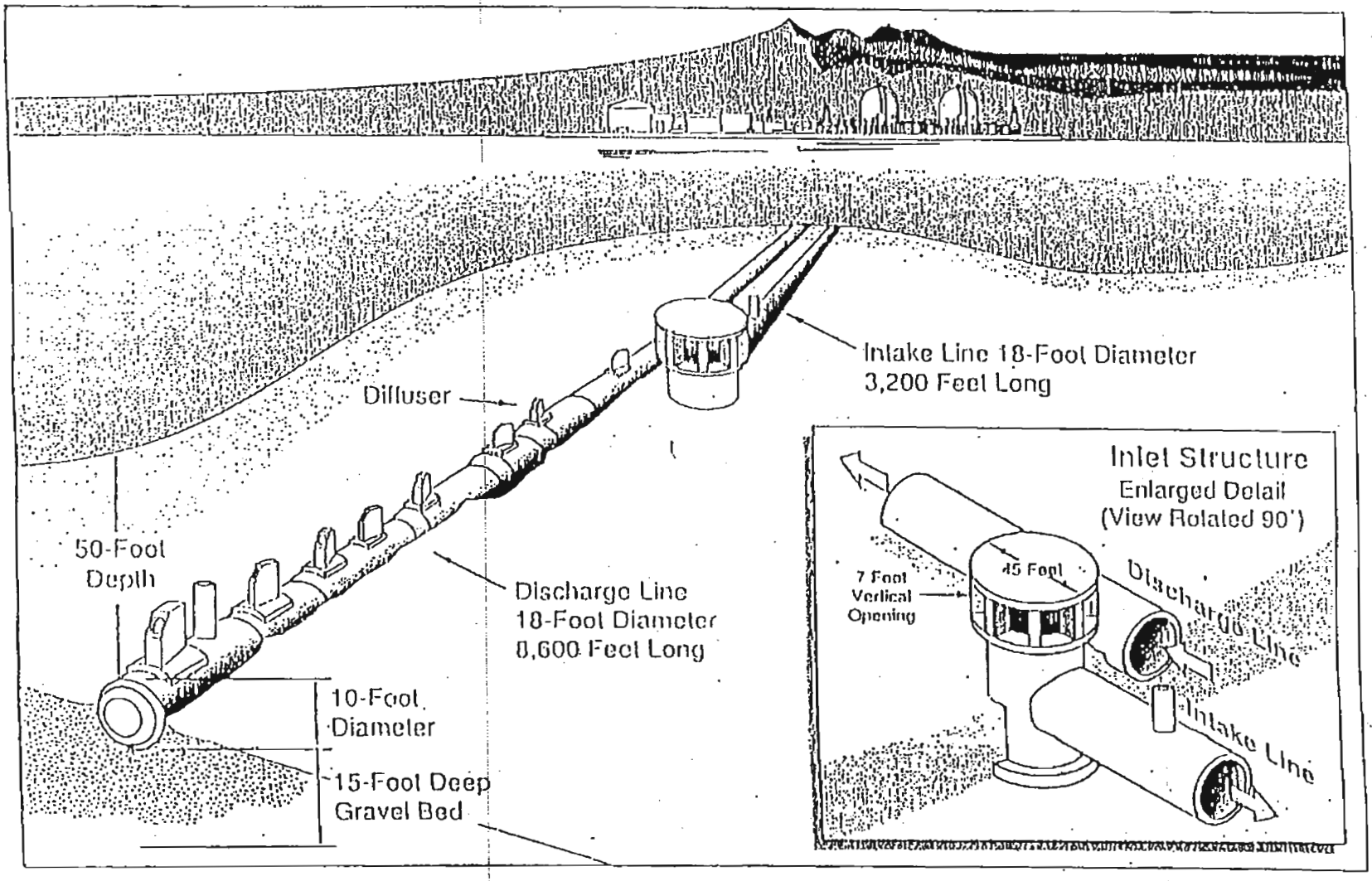
FIGURE 1 -- DIAGRAM OF THE SONGS UNITS 2/3 OFFSHORE COOLING SYSTEM COMPONENTS



MARINE MAMMAL STRANDING REPORT

SID# _____

FIELD NO. _____ NMFS REGISTRATION NO.: _____.

COMMON NAME: _____ GENUS: _____ SPECIES: _____.

EXAMINER

Name: _____ Agency: _____ Phone: _____.

Address: _____.

LOCATION
State: _____ County: _____.
City: _____.
Locality Details _____.
_____.
_____.

Latitude: _____ N

Longitude: _____ W.

TYPE OF OCCURRENCE
Mass Stranding: ☐ Yes ☐ No # Animals _____
Human Interaction: ☐ Yes ☐ No ☐ ?
Check one: ☐ 1. Boat Collision
☐ 2. Shot
☐ 3. Fishery Interaction
☒ 4. Other Entrainment into power generating station.
How determined: Animal discovered in station cooling water system.
Other Causes (if known):

DATE OF INITIAL OBSERVATION
Yr. _____ Mo. _____ Day _____.
CONDITION: Check one: ☐ 1. Alive
☐ 2. Fresh dead
☐ 3. Moderate decomp.
☐ 4. Advanced decomp.
☐ 5. Mummified
☐ ?. Unknown

DATE OF EXAMINATION
Yr. _____ Mo. _____ Day _____.
CONDITION: Check one: ☐ 1. Alive
☐ 2. Fresh dead
☐ 3. Moderate decomp.
☐ 4. Advanced decomp.
☐ 5. Mummified
☐ ?. Unknown

LIVE ANIMAL – Condition and Disposition:
Check one or more: ☐ 1. Released at site
☐ 2. Sick
☐ 3. Injured.
☐ 4. Died
☐ 5. Euthanized
☐ 6. Rehabilitated and released
☐ ?. Unknown

Transported to: _____.
☐ Died ☐ Released Date:

TAGS APPLIED?: ☐ Yes ☐ No
TAGS PRESENT?: ☐ Yes ☐ No

	Dorsal	Left	Right
Tag No.(s)	_____	_____	_____.
Color(s)	_____	_____	_____.
Type:	_____	_____	_____.
Placement:		Front/Rear	Front/Rear

CARCASS – Disposition:
Check one: ☐ 1. Left at site
☐ 2. Buried
☐ 3. Towed
☐ 4. Scl. collection: (see below)
☐ 5. Edu. collection: (see below)
☐ 6. Other _____.
_____.
☐ ?. Unknown

NECROPSIED: ☐ Yes ☐ No

MORPHOLOGICAL DATA:
Sex – Check one: ☐ 1. Male
☐ 2. Female
☐ ?. Unknown

Straight Length: _____ ☐ cm ☐ in ☐ est

Weight _____ ☐ kg ☐ lb ☐ est

PHOTOS TAKEN? ☐ Yes ☐ No

REMARKS: _____.
_____.
_____.
_____.

DISPOSITION OF TISSUE/SKELETAL MATERIAL: No parts collected.
_____.
_____.