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La Jolla Children's Pool Beach Management and Water Quality Improvement Project

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LA JOLLA CHILDREN'S POOL

BEACH MANAGEMENT AND WATER QUALITY IMPROVEMENT PROJECT



by

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EXECUTIVE SUMMARY

This report describes the proposed La Jolla Children's Pool Beach Management and Water Quality Improvement Project. The La Jolla Children's Pool breakwater was constructed in 1931 to provide a sheltered swimming area for children near the Casa de Mañana (Figure 1). During the past 67 years, a broad range of users have come to rely on the pool for recreation and water access. Skin and SCUBA divers depend on the pool for access to the ocean.

Over the years, the beach behind the breakwater has gradually widened as sand has accumulated in the sheltered cove. By 1989, the beach had advanced to near the end of the breakwater, leaving little or no protected swimming area. This has caused an increased safety hazard for bathers due to the proximity to the rip tide at the end of the breakwater. In addition, water quality in the pool has been poor in recent years due to the seal population using the beach area.

A plan to restore La Jolla Children's Pool to its original design condition is presented herein. Approximately 3,000 cubic yards (yd³) of sand will be removed from the Children's Pool beach. Removing the sand decreases the beach width and restores the sheltered water pool area to its 1940s configuration. Reducing the width of the beach will make the pool safer for swimming by isolating swimmers from open-ocean wave activity. It should also improve water circulation and quality.

The sand excavated from the Children's Pool will be transported and deposited on the beach at north La Jolla Shores. This sand will provide some additional coastal protection for the area and it will improve access to the beach.

1. INTRODUCTION

The La Jolla Children's Pool Beach Management and Water Quality Improvement Project proposes to restore the swimming area and water quality of the pool by reducing the beach width. Up to 3,000 cubic yards (yd³) of sand will be excavated and removed to narrow the beach. A period of monitoring will follow to assess the effectiveness of the sand removal. The objectives of the proposed project are to: 1) reduce the beach width in the Children's Pool to historical values to improve water safety, and 2) improve the water quality by increasing water flushing and circulation.

The La Jolla Children's Pool breakwater was constructed to provide a sheltered swimming area for children near the Casa de Mañana. The project was funded by Ellen Browning Scripps and presented to the City of San Diego on 31 May 1931. This area was and remains a popular part of the La Jolla shoreline. Figure 1 shows the breakwater during construction. At the ceremony held for its opening day, Dr. Jacob C. Harper represented Miss Scripps, and said, "Ellen always had an interest in children, and children have a primary claim to the pool, to enjoy with out danger, the ocean," (La Jolla Journal, Thursday, 4 June 1931). Other historical extracts about the Children's Pool from local newspapers are presented in Appendix A.

Over the following years, a broad range of users have come to rely on the pool for beach recreation and water access. Skin and SCUBA divers depend on the pool to safely enter and exit the water. The underwater areas off Point La Jolla offer magnificent diving, but the shore is inaccessible and treacherous except at a few places, including the Children's Pool.

The breakwater featured sluices designed to be opened when necessary (La Jolla Journal, Thursday, 26 June 1930) to flush out sand that would accumulate as a beach in the sheltered area behind the breakwater. The sluices consist of four openings in the breakwater, each about 4 ft wide and 6 ft high, located near the landward end of the structure. Soon after the breakwater was completed, the sluices were permanently closed by partly filling them with concrete (Testing Engineers - San Diego, 1998).

Since 1931, the beach behind the breakwater has gradually widened as sand has accumulated in the sheltered pool. By 1998, the shoreline had advanced to near the end of the breakwater, at the mouth of the pool, leaving little or no pool area (Figure 2). The lack of protected swimming area has caused water safety concerns (Lifeguard Lt. C. H. Wright, personal communication, 1998). The original purpose for creating the Children's Pool has, therefore, been defeated by the amount of sand accretion.



Figure 1. View of the Children's Pool in 1931 during construction of the seawall
(Source: La Jolla Historical Society Photograph #90:18138-441-1).

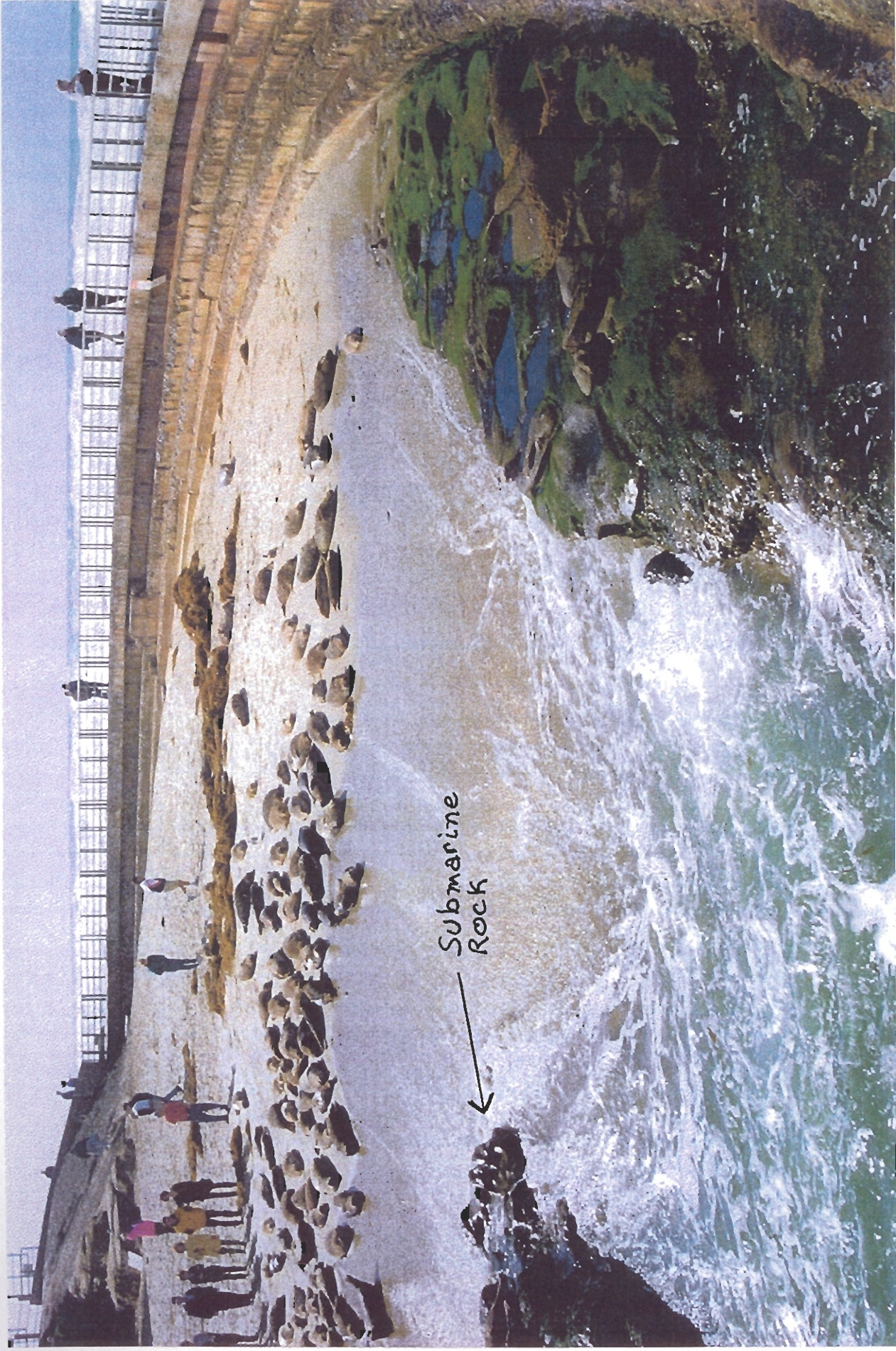


Figure 2. Photograph of the La Jolla Children's Pool on 4 February 1998.

The Children's Pool's intended use has been further compromised over the past 5 years by over 100 harbor seals that have regularly used the beach at the Children's Pool as a haul-out area. Seal feces from this large and concentrated seal population have caused fecal coliform counts in the water that greatly exceed State water-quality standards (City of San Diego, Coastal Parks Division) (Figure 3). The pool has been closed to human contact since September 4, 1997. Since the water has been deemed unsafe for human contact there are no longer human bathers in the pool. However, the seals do attract a large number of curious non-bathing observers to the beach. This has, in turn, raised two additional interrelated concerns: safety of the onlookers and possible seal-harassment in violation of the Federal Marine Mammal Protection Act (16 USC 1361, *et seq.*).

For several years water samples have been collected for analysis of water quality in the Children's Pool. Results for the period from August 1997 through July 1998 are presented in Figure 3. Water quality has been poor due to elevated total and fecal coliform bacteria most probable number (MPN) counts. The seals and sea lions are using the beach as a haul-out area, and defecating on the way to shore, and on the beach.

No evidence of prior extensive use of the Children's Pool beach by seals, sea lions, or any other marine mammals could be found or documented in the historical research undertaken for this report. The harbor seals seem to have recently decided that the pool's beach was a desirable place to haul out (La Jolla Light, May 15, 1997).

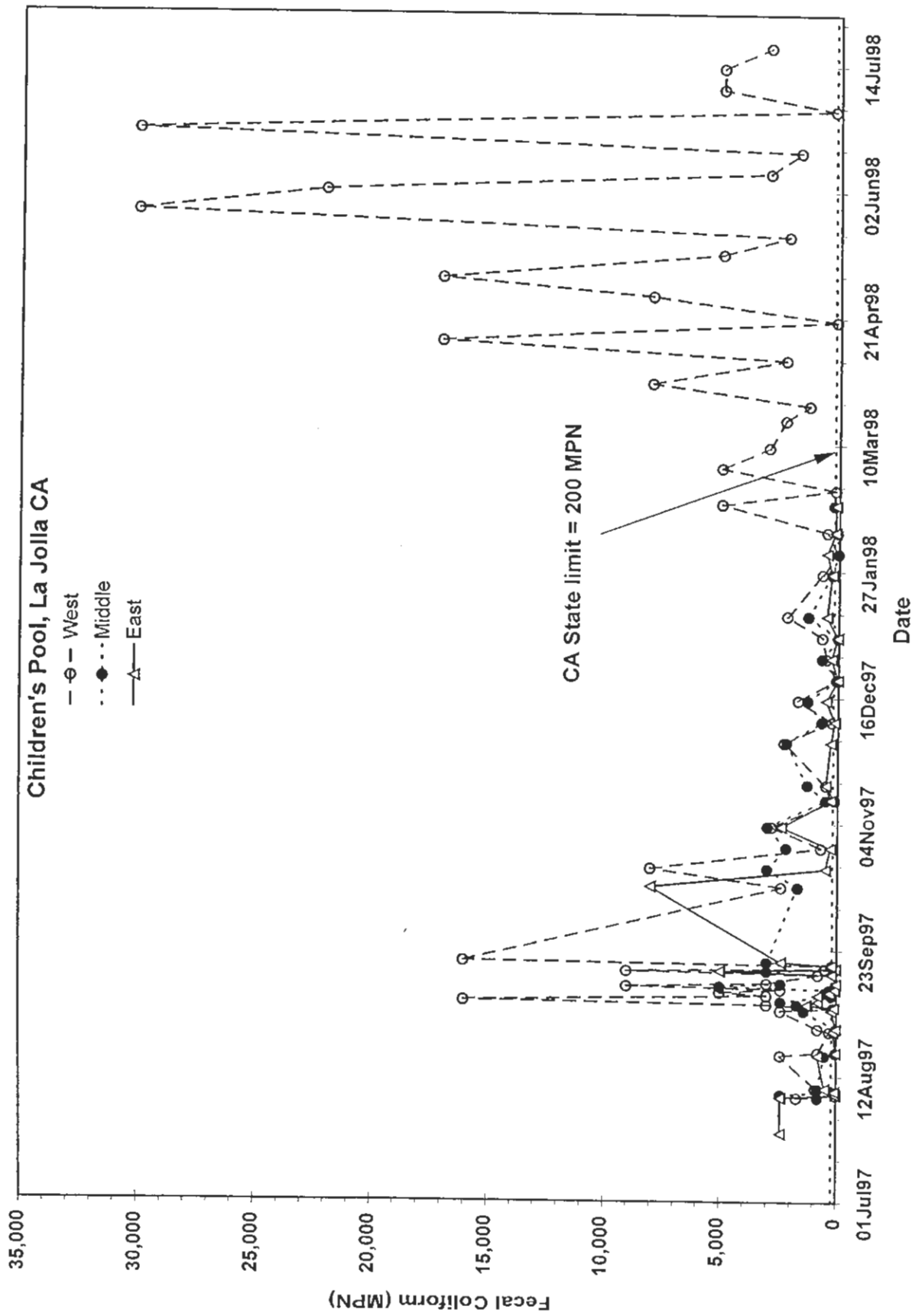


Figure 3. Water quality samples collected for the period September 1997 to July 1998.

2. PHOTOGRAPHIC HISTORY OF CHILDREN'S POOL BEACH

Aerial photographs of the Children's Pool are available dating back to the 1920's (San Diego Historical Society). The photos are presented in Appendix B. Two photograph in Figure B-1 was taken in 1924 (#7647) and shows the Casa Cove, and the pocket beach that existed at the time, prior to construction of the Children's Pool breakwater.

The amount of sand on the pocket beaches in the area was somewhat reduced by the time the breakwater was built in early 1931, as shown in an aerial photo taken during construction (Figure B-2; #90:18138-441-1). The sand volume in Casa Cove cannot be seen in this picture. However, Figure B-3 is a ground photo (La Jolla Historical Society) taken on 15 June 1931 and shows a narrow beach inside the breakwater, and a large, calm-water swimming area. The photo was apparently taken near the mean sea level tide stage, judging from the number of steps (or benches) exposed between the top of the breakwater and the water surface in the picture (Savage, 1930). The dry-sand beach width extended seaward about 30% of the length of the breakwater at this time. This was estimated by counting the number of railing posts between the root of the breakwater and the shoreline (about 12), and dividing by the total number of posts (about 40).

The June 1931 photograph also indicates that about seven steps were exposed above the mean-sea-level (MSL) shoreline. The top of the sluices is located between steps 6 and 7, suggesting that the sluice openings on the inside of the breakwater are located at the approximate position of the MSL shoreline at the time of construction. Therefore, the sluices likely were initially partly open, and partly covered by sand. The sluices were built at a convenient gap in the bedrock reef structure. The top of the openings is at approximately elevation +0.5 ft (NGVD) and the bottom at -5.5 ft (NGVD). We surmise from this evidence that the sluices may have been built where they were to preserve the beach width at more or less this position, that is, at a location about 1/3 of the way along the length of the breakwater. These photos also show that the beach elevation at the sluices was about 7.5 ft lower than it is at the present time (Testing Engineers - San Diego, 1998).

By January 1935, the shoreline had advanced to approximately 40% (17 posts) of the breakwater length, as shown in Figure B-4 (#79:741-5). There are about six steps exposed in this photo, which gives a clear view of the location of the sluices. The sandy beach extends nearly to the bedrock outcrop, and the sluice openings are not visible. This means that either the sluices had been sealed by this time, were simply not effective, or the beach had widened enough to cover the openings.

By 1941 (Figure B-5; #79:741-712), the beach reached about half way (20 posts) along the breakwater, and well past the inshore edge of the bedrock outcrop. At this point, the beach was

twice as wide as the distance from the breakwater root to the sluices. In May 1948 (Figure B-6), and July 1953 (Figure B-7; #UT 8248-15), the beach reached approximately 60% (24 posts) of the breakwater length. A new railing was constructed along the seawall after the old railing was severely damaged by the 1982/83 cluster storms. By about 1989 (Cameron and Morgan, 1990), the beach width was about 75% (50 posts out of about 67 at this time) of the breakwater length (Figure B-8). Finally, by early 1998, the shoreline extended to about 80% (55 posts) of the length of the breakwater (Figure 2).

The history of the beach width at the Children's Pool suggests that the sluices were ineffective in keeping the beach at the initial 1931 width, or that the openings were closed for some reason within a few years after the breakwater was completed. Either way, the beach gradually accreted. Therefore, it is not known how effective the open sluices would be in maintaining a narrow beach. For this reason, future maintenance activity should include a plan to physically remove sand from the Children's Pool as necessary to preserve the desired beach width. Based on the beach-width history, and the approximately 3,000 yd³ of sand accretion over the 67-year span since the breakwater was built, less than about 45 yd³ of material would have to be removed each year to maintain an equilibrium width. This amounts to removing only six dump truck loads per year, and could likely be carried out on a three to five-year schedule.

3. BASELINE SURVEY

A baseline beach survey was conducted on 15 April 1998 to establish the Children's Pool beach configuration and the approximate volume of sand in the cove. An electronic total station was used to measure beach-profile elevations, and to demarcate the locations of the breakwater and other features relative to known benchmarks. A plan for the Children's Pool, including profile locations, the breakwater, and the four sluice locations is shown in Figure 4 relative to California Coordinates (State Plan, Zone 6, NAD 27). Figure 5 shows the elevations of the wetted line on the beach face and the elevations of cross-sections C2, C3, and C4. Figure 6 shows the elevation along the ranges R1, R2, and R3.

The wetted-bound line on the beach is often used as a rough indication of the mean high tide line (Ewing, 1993). The wetted bound line is simply the approximate location of the boundary between wet and dry sand on the beach face, and probably indicates the extent of the last higher high tide. The elevation of the wetted bound varied from 2.55 to 4.0 ft (NGVD), while the true elevation of the mean higher high water (MHHW) datum is about 2.8 ft above NGVD.

La Jolla Children's Pool Survey (12JUN98)

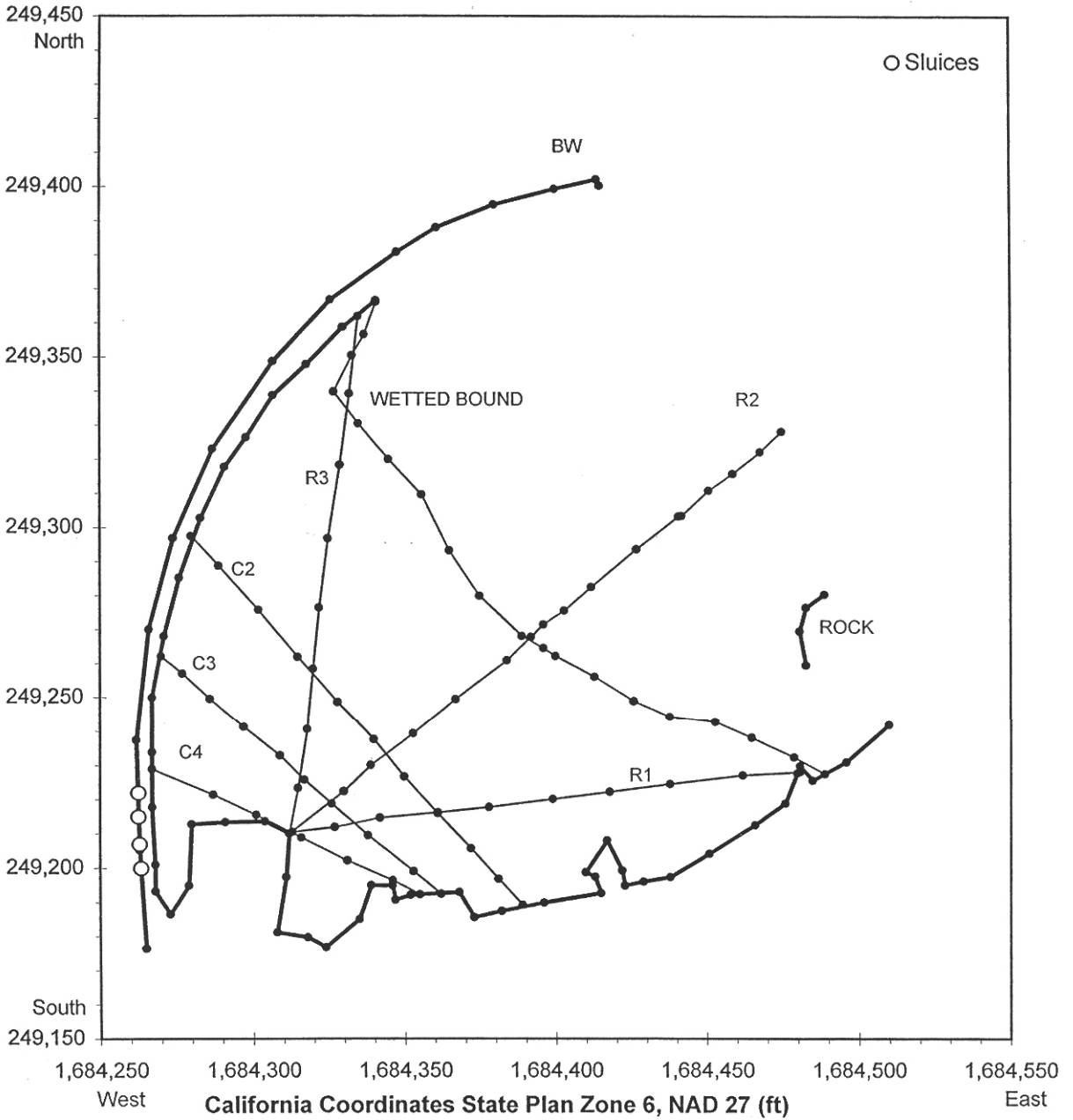


Figure 4. The survey plan, including profile locations, relative to the California Coordinates.

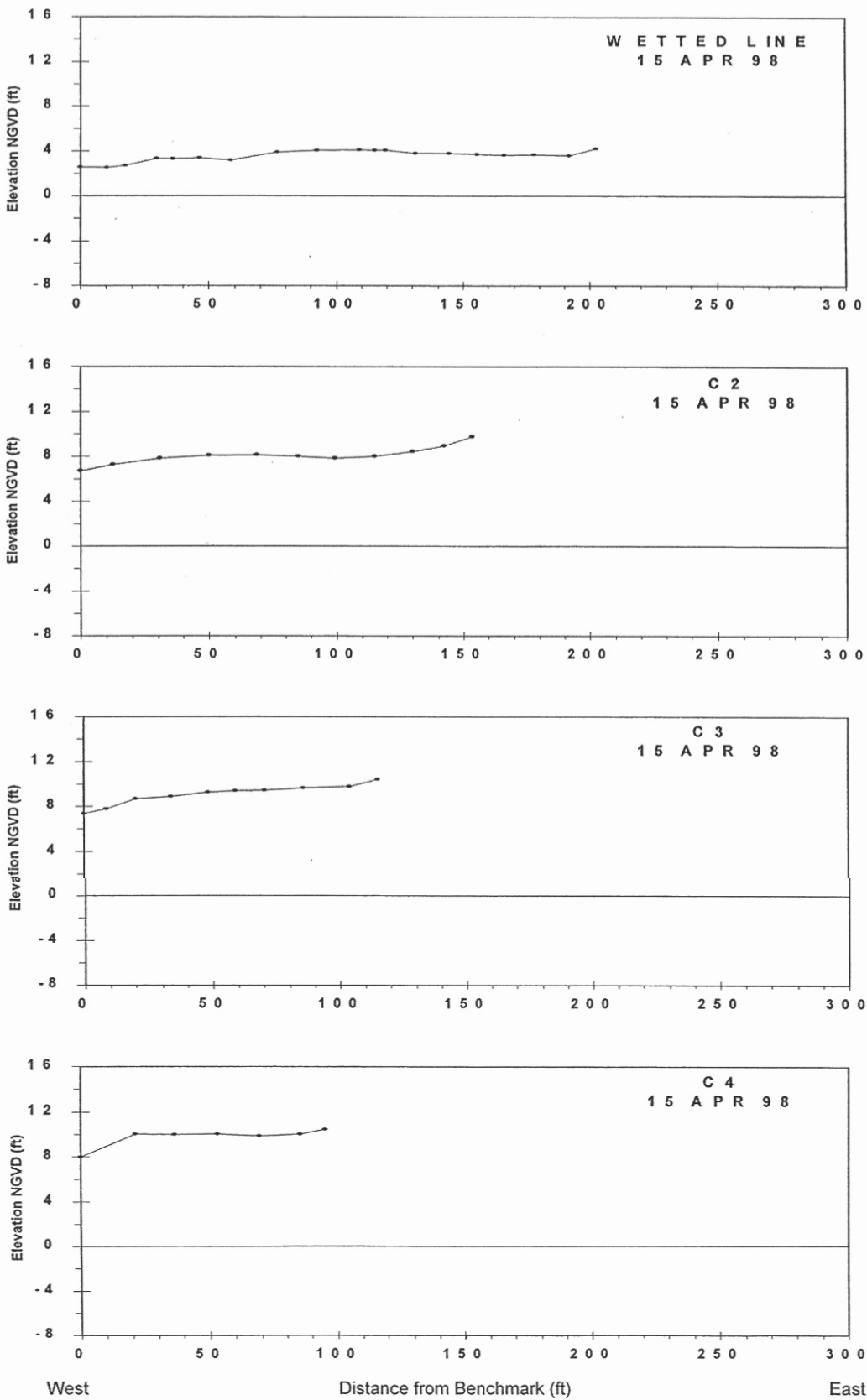


Figure 5. Elevations of the wetted line and the cross-sections C2, C3, and C4.

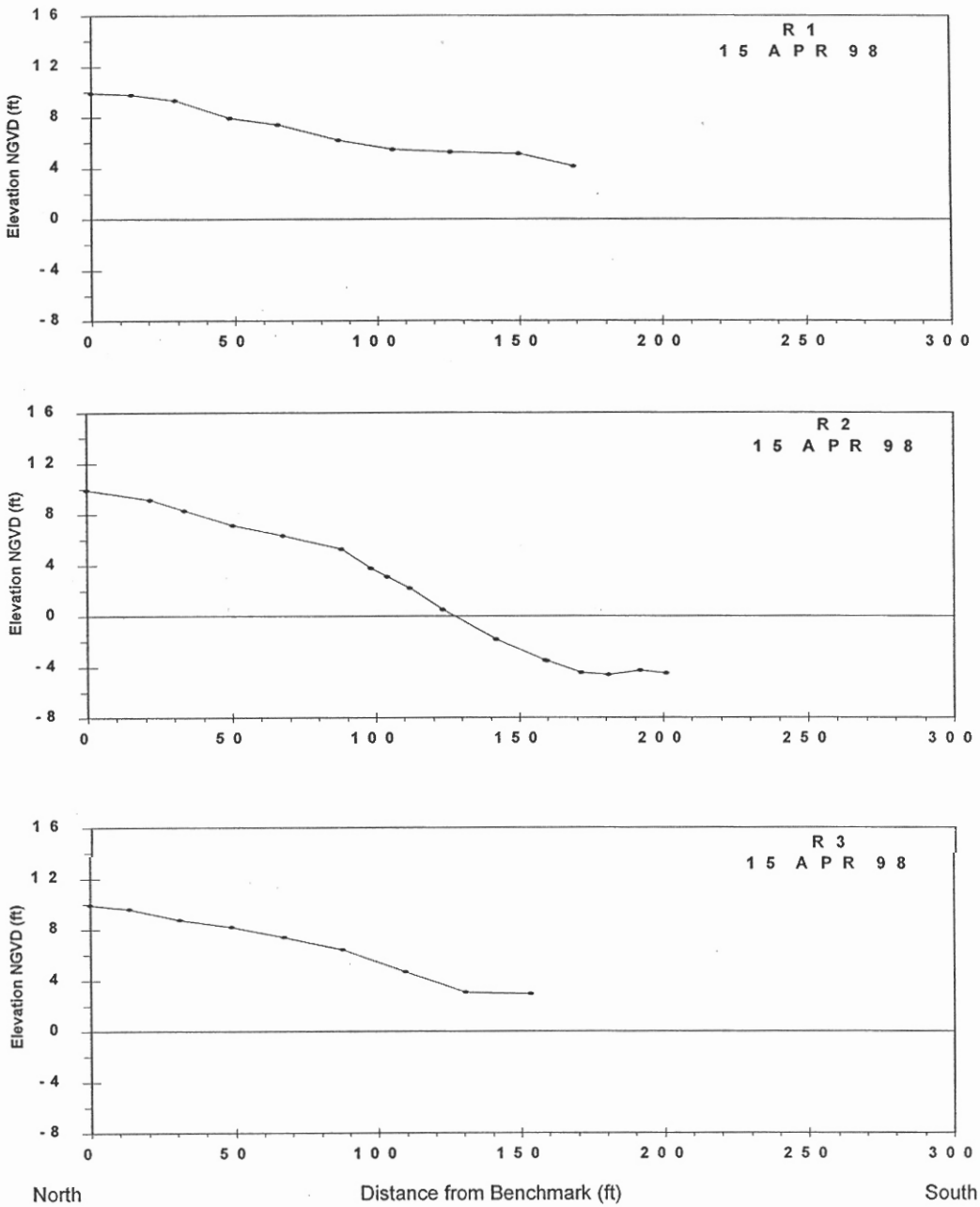


Figure 6. Elevation along the ranges R1, R2, and R3.

4. PROJECT DESCRIPTION

The sand to be excavated is between the run-up line and the back of the pool as shown in Figure 7. The run-up line determines the limits of water washed to the beach by waves. Since waves are usually small at the Children's Pool the run-up line is approximately the wetted line. During excavation, a berm (acting as a dam) will be left at the seaward edge to enable the equipment to operate smoothly. After sand removal, the sand berm will be evenly re-distributed landward of the berm on the beach face and sea bottom.

The proposed project will consist of removing up to 3,000 yd³ of beach sand. Figure 8 shows the existing beach profile and the proposed profile after excavation. About 720 ft³ of sand will be removed per foot of beach. After completing the excavation, the beach profile will be slowly adjusted such that it will be deeper at the outer side and narrower at the landward side, providing children with space to swim. The project will be conducted in the off-season, between October 1st and Memorial Day weekend. A monitoring period will follow these steps to assess the effectiveness of the sand removal in fulfilling the objectives of the project. The sand characteristics in the pool are described below, followed by a discussion of proposed excavation, transport, and disposal options and methods.

4.1. Sand Characteristics

4.1.1. Grain Size Analysis

The sand in the Children's Pool has a median grain size of greater than 0.660 mm. This is somewhat coarser than the sand found on La Jolla Shores Beach, which has a median grain size of about 0.230 mm. The cumulative grain-size distribution for four samples collected in August 1998 from La Jolla Children's Pool and from north La Jolla Shores are shown in Figure 9.

4.1.2. Bacterial Counts

On 19 May 98 and 23 Jun 98, 6-in core sand samples were collected from the Children's Pool beach and analyzed for bacterial coliform, both total and fecal. Figures 10(a) and 10(b) show the location of the samples collected within the area to be excavated and the value of the coliform in MPN (fecal and total values were identical). None of the samples collected exceeded the State limit of 1,000 MPN for total coliform. However, one sample collected in May 1998 slightly exceeded the State limit of 200 MPN for fecal coliform. Before any excavation will commence, sand samples will be collected and analyzed to ensure that the sand excavated and transported to north La Jolla Shores beach complies with the State standards.

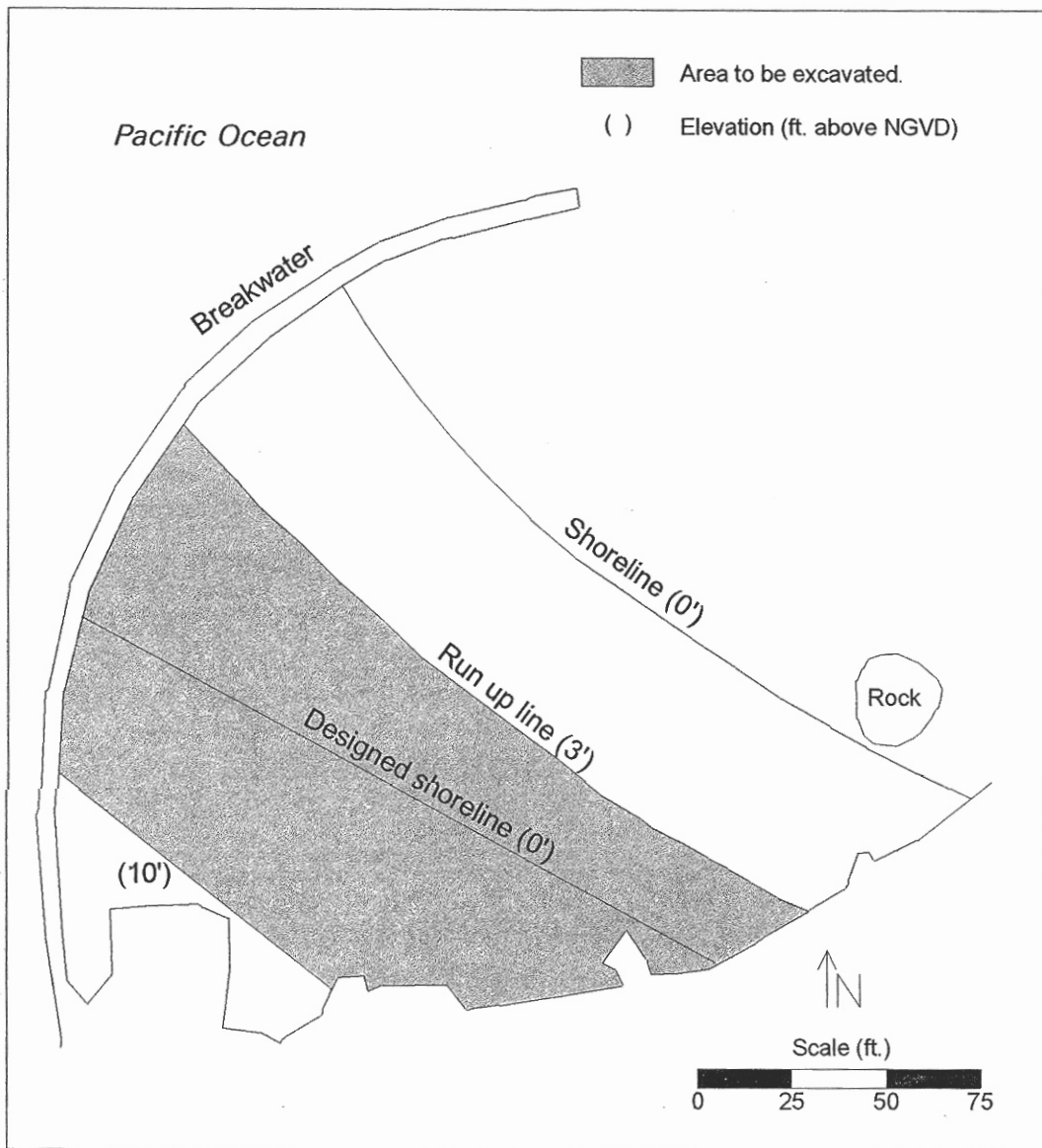


Figure 7. Children's Pool Excavation Plan.

Children's Pool Target Beach Profile

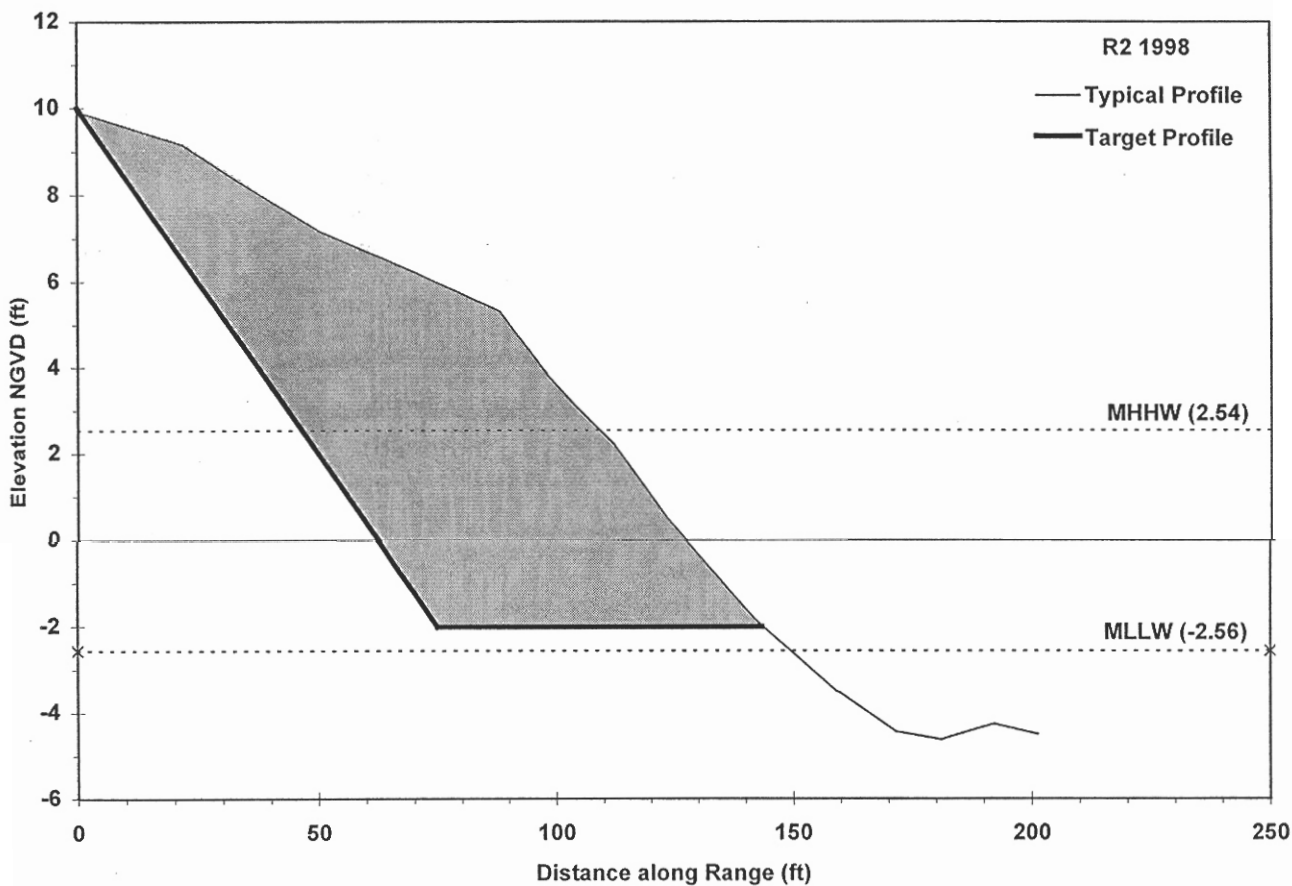
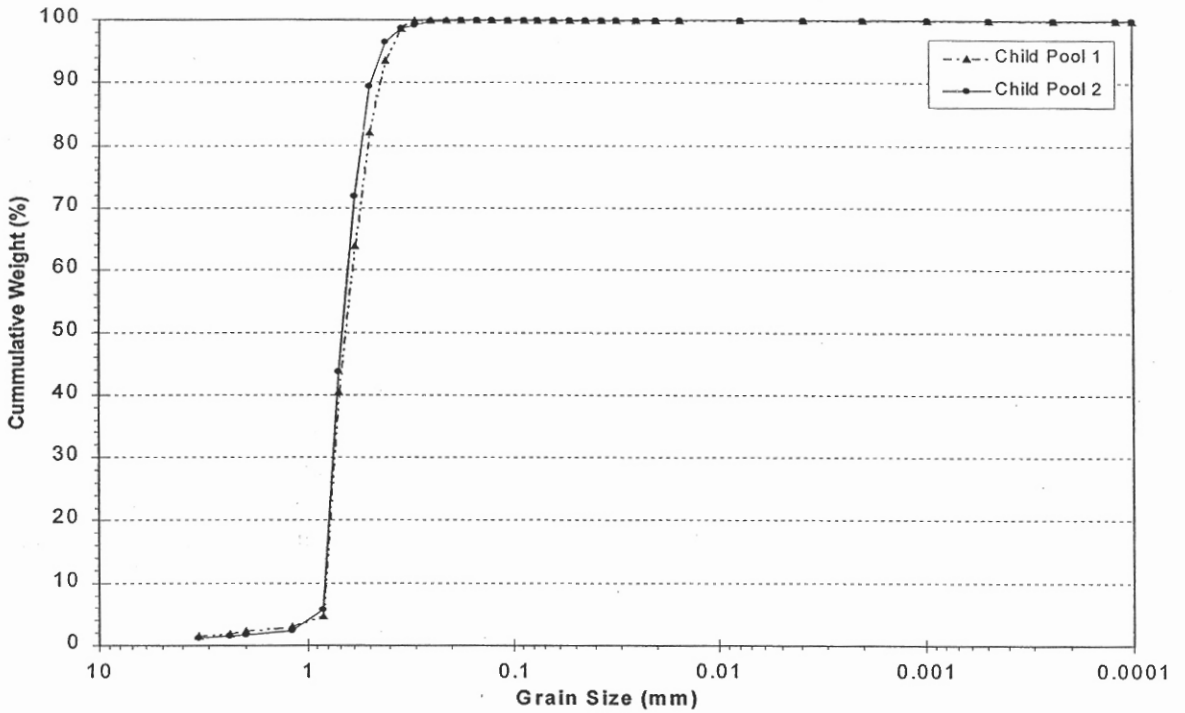


Figure 8. Beach profile configuration before and after dredging.

La Jolla Children's Pool Sand Size Analysis



North La Jolla Shores Sand Size Analysis

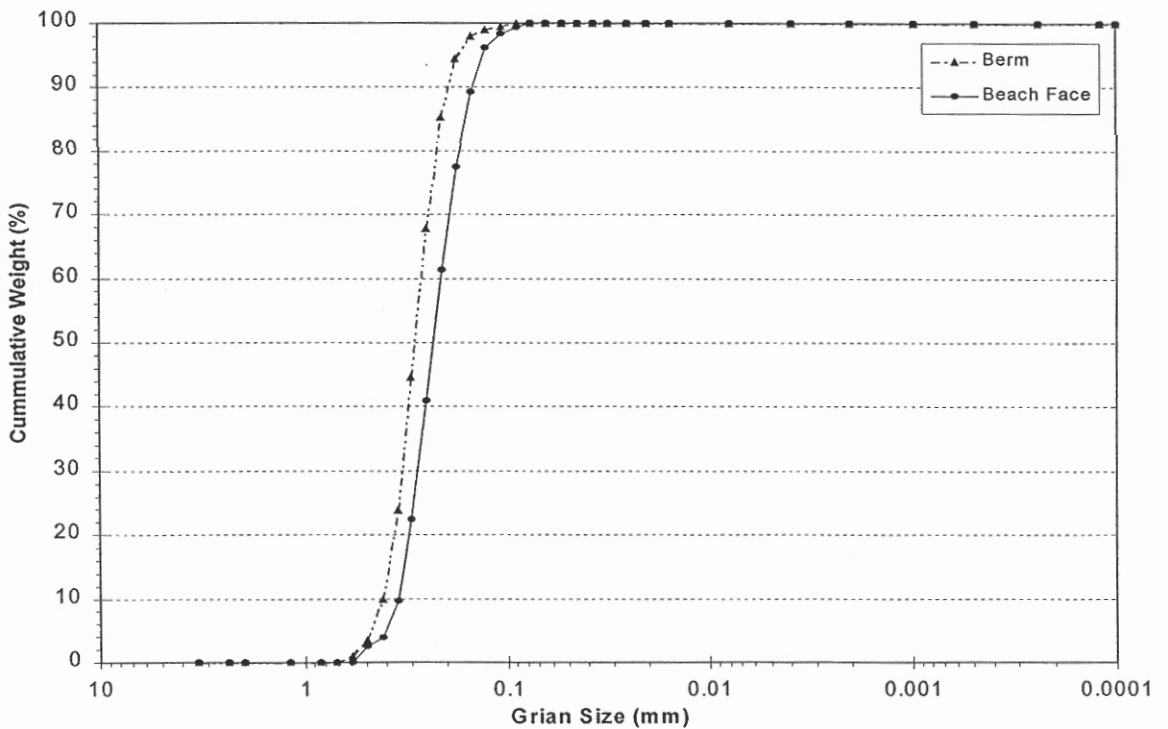


Figure 9. Cumulative grain-size distribution for sand samples from the Children's Pool and North La Jolla Shores.

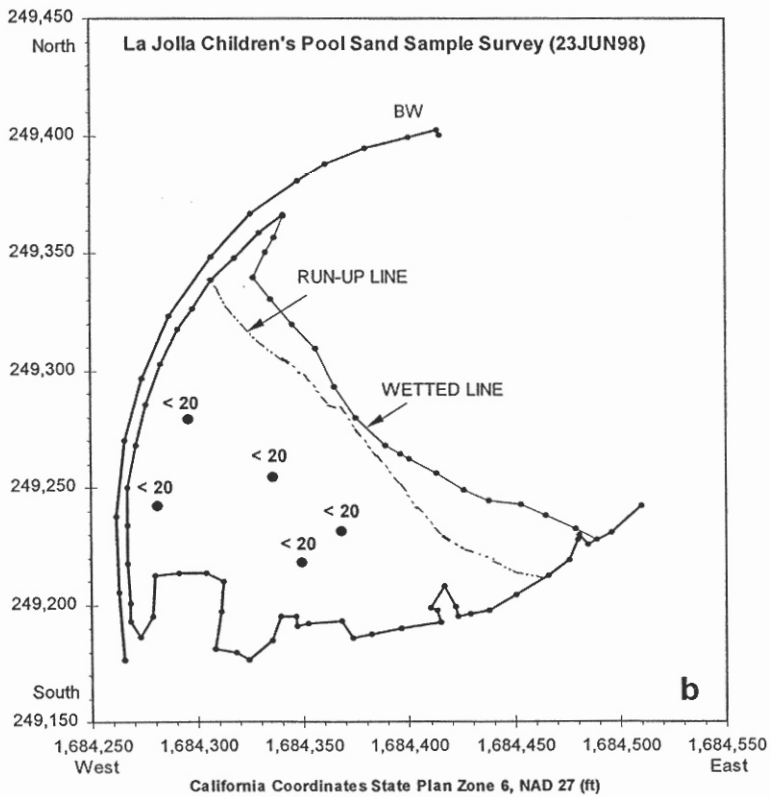
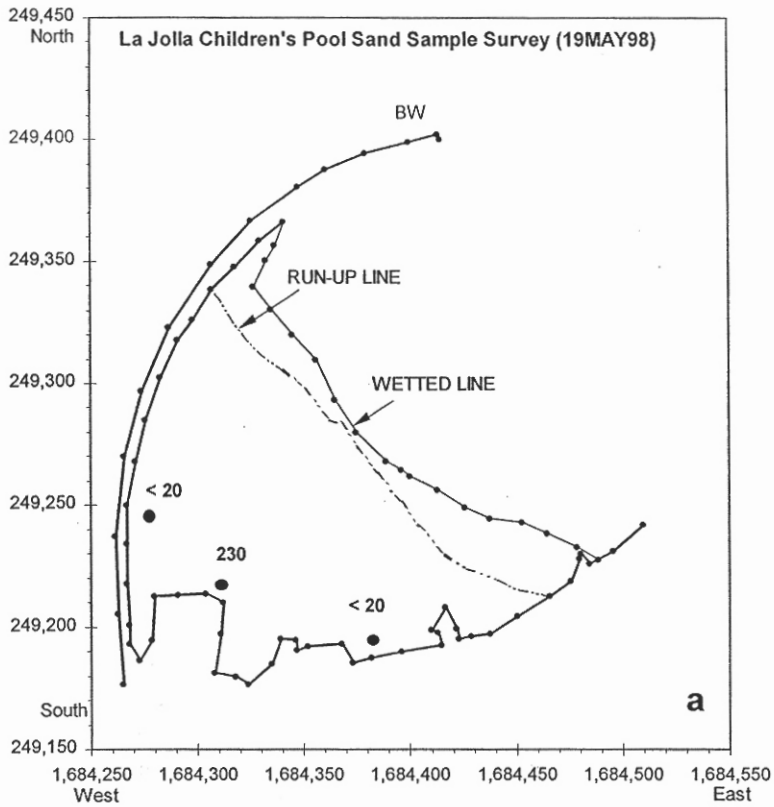


Figure 10. Location map of sediment samples collected from the Children's Pool on 19 May 98 and 23 Jun 98 (values represent MPN for fecal coliform).

4.2. Sand Excavation and Transportation

Sand will be removed from the Children's Pool beach by a front-end loader and carried via the ramp to the street where it will be deposited in dump trucks. Prior to excavation, six sand samples will be taken and analyzed for total coliform and fecal coliform to ensure that the sand transferred to north La Jolla Shores is within the permitted limits (State of California limits are 1,000 MPN total coliform and 200 MPN for fecal coliform). The six samples will be collected from the east, middle, and west beach along the run-up line and a line between the run-up line and the ramp.

The loader capacity is about 5 yd³, while the City of San Diego-owned trucks can carry up to 8 yd³. The ramp is too steep for the dump trucks to drive down onto the beach. The ramp may have to be temporarily improved to support the loader traffic. The loaded trucks will proceed to La Jolla Shores Beach along the route shown in Figure 11. Twenty truckloads, each carrying 5 yd³ per trip or about 100 yd³ of sand per day, will be removed from the La Jolla Children's Pool and taken to La Jolla Shores.

Therefore, it is anticipated that about 30 working days will be required to complete the excavation of up to 3,000 yd³ of material. In order to complete the project more quickly, larger trucks would need to be used or more trips would need to be made per day (trucks with a capacity of 16 yd³, moving 30 truckloads per day, can complete the project in 6 days). The final plan should be decided by the City of San Diego after discussions with the contractors.

4.3. Sand Disposal Options and Methods

The beaches in north La Jolla Shores have been severely damaged by the 1997-98 El Niño driven storms. During high tide, the water at north La Jolla Shores beach reaches the seawalls. While the proposed amount of sand for beach nourishment on La Jolla Shores is relatively small, the sand will be spread over 900 ft (about 300 yd) covering 10 yd³/yd of beach, which will provide some additional flooding protection for the area. Also, it will improve pedestrian access to the beach.

Two sites were considered for placement of the excavated material. These are La Jolla Shores and a pocket beach adjacent to the Children's Pool, either to the north or south. La Jolla Shores is the preferred alternative, since it is already a wide, sandy beach. In contrast, the pocket beach areas around the Children's Pool are all fronted by hard-bottom substrate that would be covered if the Children's Pool sand were deposited on them. According to a biological survey conducted by Doug Gibson, Marine Biologist, no significant biological impacts would occur at the Children's Pool from excavation of sand or at north La Jolla Shores from sand placement (Appendix C).

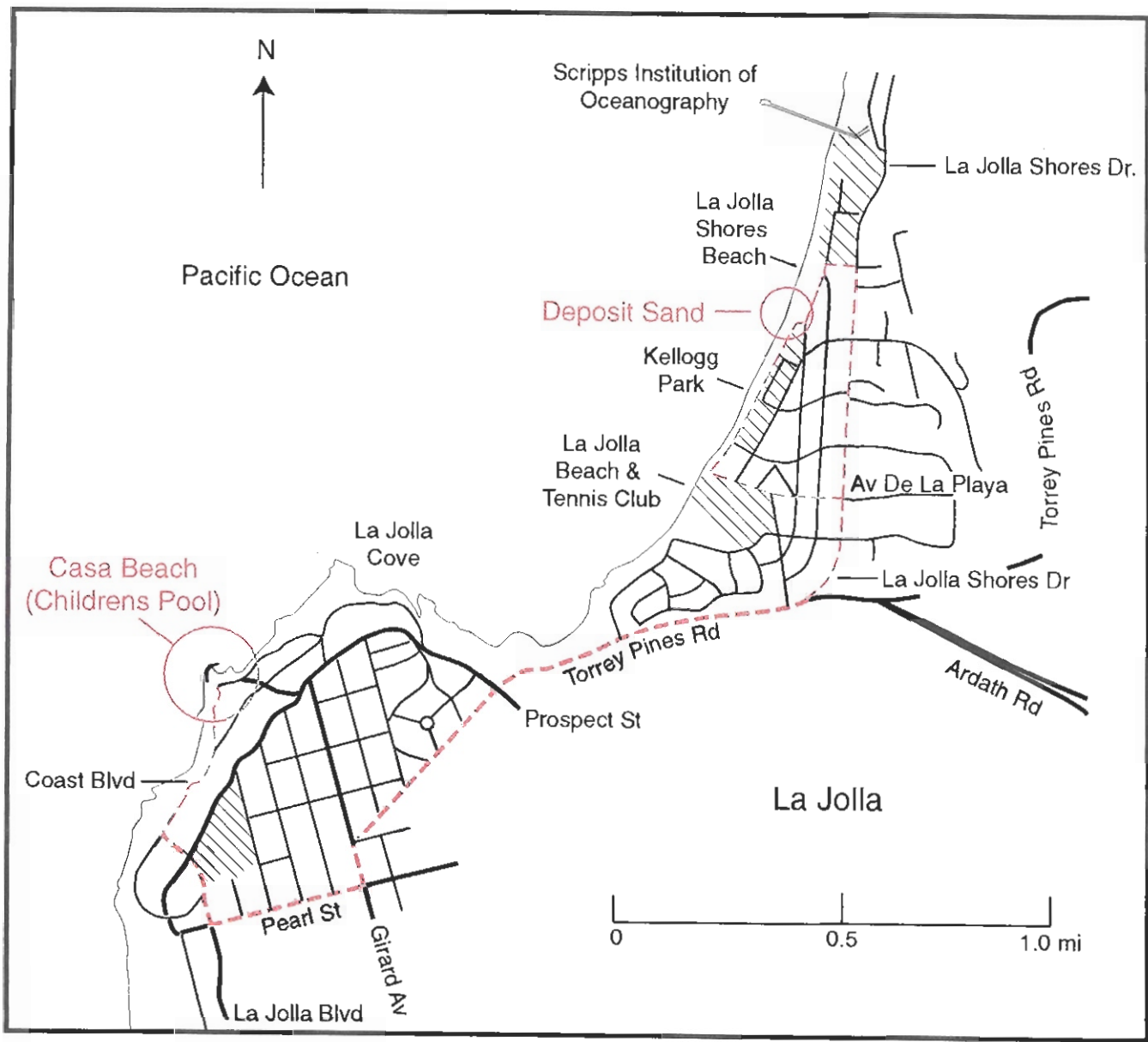


Figure 11. Truck route from La Jolla Children's Pool to La Jolla Shores Beach.

4.4. Beach Profile at North La Jolla Shores Disposal Site

A beach-profile survey was made at north La Jolla Shores on 23 August 1998 at two locations within the disposal area. Figure 12 shows the beach profile at R1 and R2 and Figure 13 is a photograph taken on August 17, 1998 of the disposal site. This photograph shows the lack of beach access at this stretch of beach during high tides.

4.5. Sluice Reopening

Figure 4 shows the location of the sluices with respect to the breakwater. Reopening of the sluices, creation of new sluice ways, or other measures may be considered at a later date to improve water quality in the Children's Pool. At that time, a full analysis can be made as a part of the permit process.

4.6. Project Schedule

The City of San Diego intends to begin sand excavation and removal to La Jolla Shores as soon as possible after 1 October 1998. This schedule would allow the work to begin at the end of the summer tourist and bathing season, after the seasonal departure of the Least Tern from California, and after the end of the seasonal grunion runs.

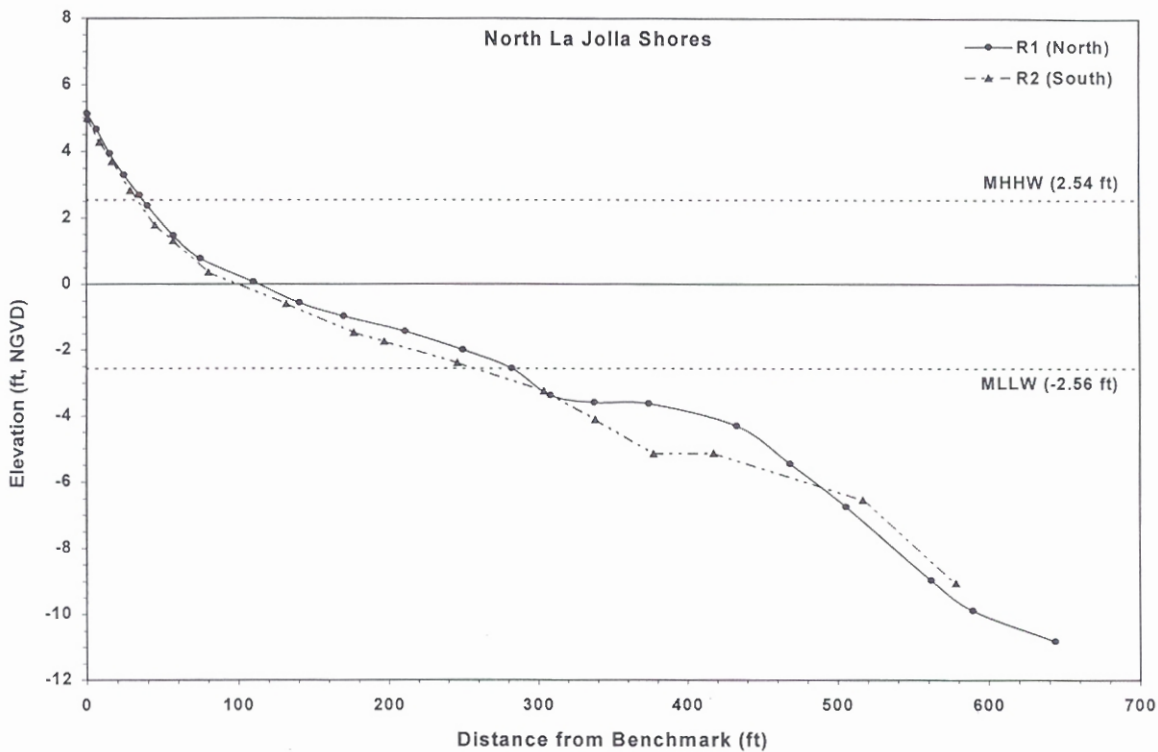


Figure 12. Beach profiles of north La Jolla Shores disposal site.

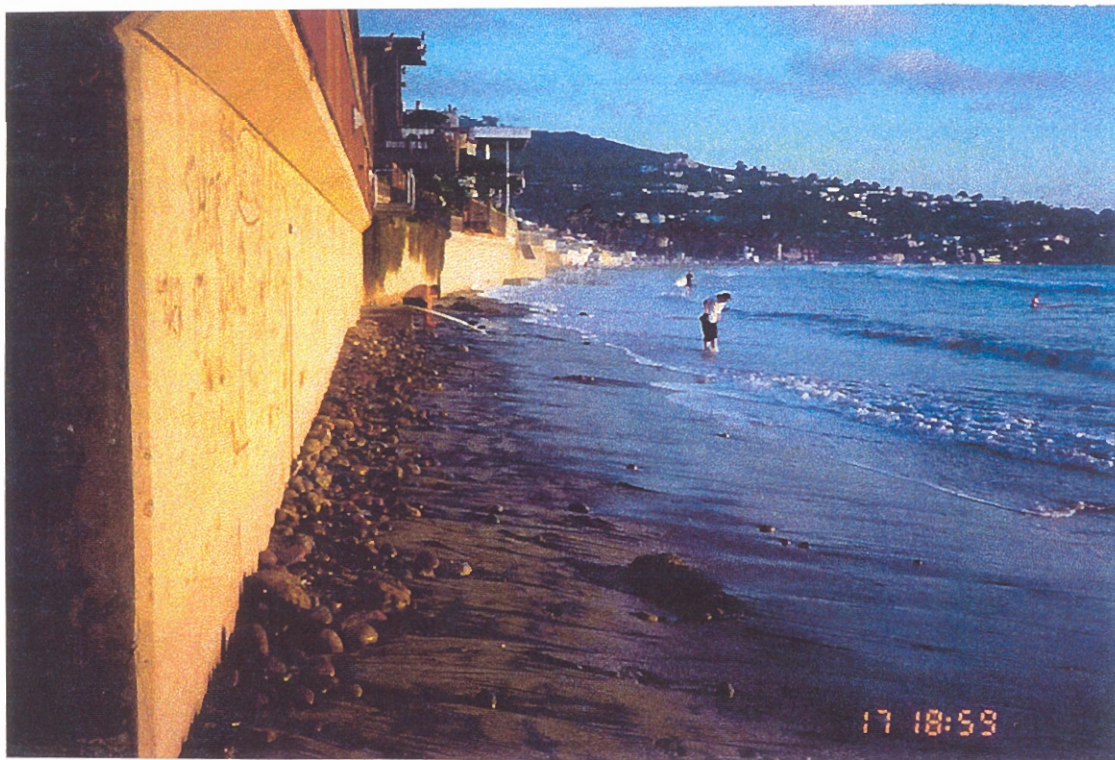


Figure 13. Photograph of north La Jolla Shores at the disposal site taken on 17 Aug 98.

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- U.S. Code 16 § 1361 *et seq.*, 1972. Marine Mammal Protection Act of 1972, amended through 1994.

APPENDIX A - EXTRACTS FROM NEWSPAPERS

La Jolla Journal, Thursday June 4 1931

Ellen Scripps started the Children's pool project in 1921. In spring 1931 it was constructed and on May 31 a ceremony was held for its opening day. Ellen always had an interest in children. Dr. Harper once said, "children have a primary claim, enjoy with out danger, the ocean."

The day of the ceremony everyone rushed into the pool in their suits laughing with joy a demonstration of what the pool and its new settings will mean in the future.

La Jolla Journal, "La Jolla to have Pool for Children," Thursday June 26, 1930 #26

Sluiceways will be a part of the plan and can be opened when required. The rocky ledges in the foreground that have suffered the effects of the weather will have clear and practical "dental work" done on them, to preserve their picturesque outlines, and prevent further erosion. Another suggested improvement may be bathing stalls or lodges and perhaps observation seating, with a protective awning. In all the work, an unpleasantly artificial aspect will be avoided. The pool will be useable, safer for its devotees,

Lots of gratitude and thanks go to Ellen for her generous plan that will give safety and beauty to a favorite part of La Jolla's shoreline.

La Jolla Year by Year, "Children's Pool," by Howard S.F. Rundolph La Jolla 1946

Gift from Miss Ellen Scripps to the village. Desired to make a pool for the children where they could play in the ocean and yet be quite safe. She built a breakwater in the little cove near Casa, utilizing some rocks that reared up near the shore for that purpose. As so often happened, this gift from Miss Scripps increased in cost as the work progressed, so the outlay was much more than originally anticipated.

Built in spring 1931 and on May 31 there were elaborate ceremonies in which Mr. Jacob C. Harper representing Miss Scripps, presented the pool to the city in her name.

La Jolla Story of a Community 1887-1987, by P. A. Schaelchlin, Pub. Friends of La Jolla Library.

-1920 Near drowning prompted the warning that the sea is dangerous

-1921 Ellen Scripps consulted with H.N. Savage (City Engineer)

The sides will be terraced up to have the look of a miniature stadium, and to give access to the top, which may be used as a promenade, except in rough weather. The breakwater will remove the menace of the current that has swept through at high tide and occasionally imperiled unwary bathers.

J.T. Kean, "Most valuable of Ellen Scripps benefits to La Jolla, Measured in terms of good to the greatest number were those investments in human happiness designed for the little ones.

The day of the ceremony everyone rushed into the pool in their suits laughing with joy, a demonstration of what the pool and its new settings will mean in the future.

San Diego Union, "Swimming Cove Extension Urged," Friday Morning, September 28, 1934

Extension of the swimming cove in La Jolla was urged by civic interests. Project includes digging back into the adjacent hill and terracing the slopes. The excavated material would be dumped on the ocean side near Alligator head, while keeping the present sandy beach in its excellent condition.

Point Newsweekly, "Miss Ellen Scripps of Prospect Street," December 9, 1954

Ellen Scripps had great interests in research and educational institutions; she was greatly concerned for children, their character, and development.

In La Jolla, the many parks she gave the city, as well as the Community Center and Playgrounds were symbolic of her concern for the welfare of Children. At a cost of over \$50,000, she financed the building of the stone breakwater at the Casa de Mañana Cove, for the protection of children of riptides. This followed the drowning of two children who were sucked out to sea by currents.

San Diego Union, "City Rededicates Pool In Ellen Scripps Honor," Friday October 13, 1967

City Councilman Helen Cobb said, the pool was constructed because of the death of two children in the surf near the area. Miss Scripps gave funds to provide a safe swimming area, Mrs. Cobb said.

Mayor Curran said, Miss Scripps established "great and enduring philanthropies not only for the benefit of her adopted city of San Diego, but for the entire nation." He also said the Ellen Browning Scripps Foundation "continues her philanthropies for the enduring benefit of citizens of the far future.

La Jolla Light, "Seals' presence irks beachgoers," by Kimberly Epler, May 15, 1997

Over the past five years they've [beach goers] seen the population grow from a few seals on local rocks to days when 150 animals are sunning themselves on the beach.

APPENDIX B

PHOTOGRAPHIC HISTORY OF THE CHILDREN'S POOL

This appendix contains historical photographs of the La Jolla Children's Pool area, which were obtained from the San Diego Historical Society.

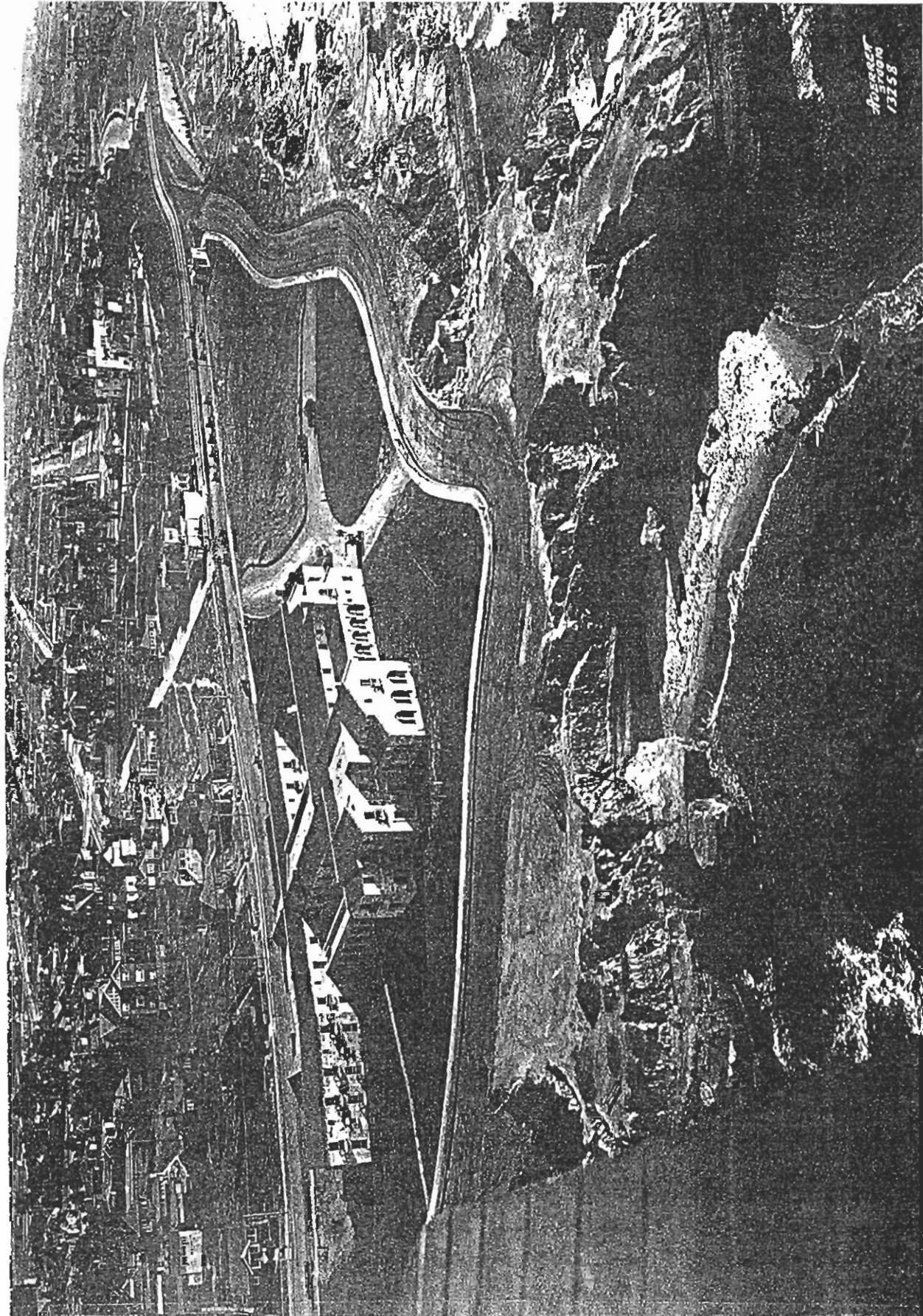


Figure B-1. View of La Jolla in 1924, prior to the Children's Pool seawall construction (Source: La Jolla Historical Society Photograph #7647).



Figure B-2. View of the Children's Pool in 1931 during construction of the seawall
(Source: La Jolla Historical Society Photograph #90:18138-441-1).

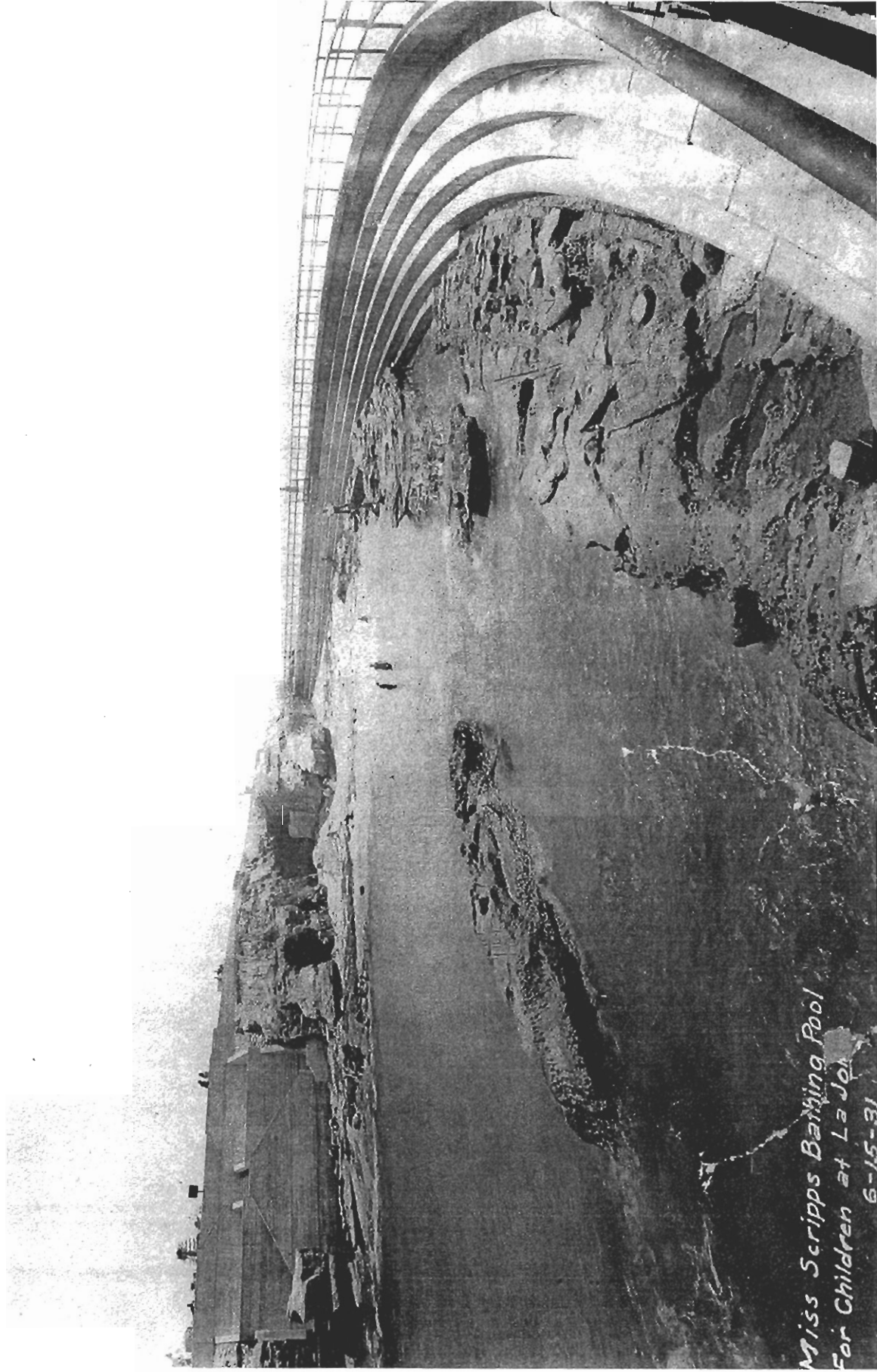


Figure B-3. Miss Scripps Bathing Pool for Children at La Jolla, June 15, 1931
(Source: La Jolla Historical Society).

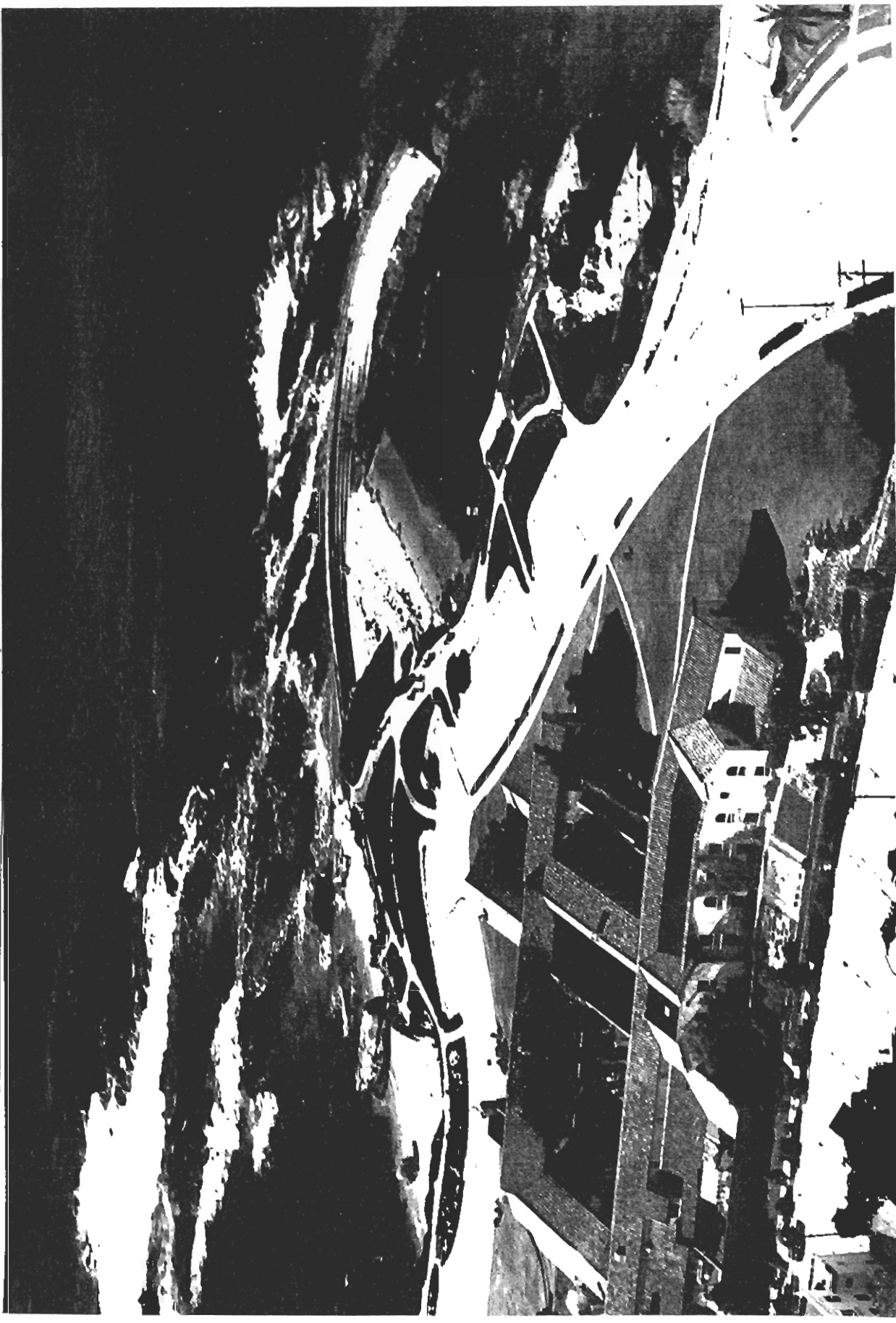


Figure B-4. View of the Casa de Mañana and the Children's Pool on January 26, 1935
(Source: La Jolla Historical Society Photograph #79:741-5).



Figure B-5. View of the La Jolla Children's Pool on July 14, 1941
(Source: La Jolla Historical Society Photograph #79:741-712).



Figure B-6. View of the Casa de Mañana and the Children's Pool on May 21, 1948
(Source: La Jolla Historical Society).



Figure B-7. View of the La Jolla Children's Pool on July 12, 1953
(Source: La Jolla Historical Society Photograph #UT 8248-15).



Figure B-8. La Jolla Children's Pool in 1989 (Source Cameron and Morgan, 1990).

APPENDIX C
BIOLOGICAL SURVEY AT LA JOLLA CHILDREN'S POOL AND AT
NORTH LA JOLLA SHORES

**DOUG GIBSON
P.O. BOX 230634
ENCINITAS, CA. 92023
760-436-3944**

August 19, 1998

Mr. Hany Elwany
Coastal Environments
2166 Avenida de la Playa, Suite E
La Jolla, CA. 92037

RE: Beach Profile and Biological Survey at La Jolla Children's Pool

Dear Mr. Elwany,

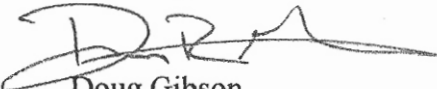
On April 15, 1998 I performed a beach profile and biological survey at the La Jolla Children's pool for your firm. The purpose of the survey was to gather data on current sand amounts within the enclosed area and to take note of any biological features (i.e. substrate, kelp beds) that may be impacted by removing the sand. On June 10, 1998 I also performed a biological survey at north La Jolla Shores beach. This survey was intended to identify impacts that may occur due to the placement of sand along the beach. The following are my results and suggestions.

During both surveys I noted no impacts that would arise by either removing or placing sand at the appropriate beaches. The reef located at the children's pool would not be impacted by removing the estimated 3000 cubic yards of material. The project area surveyed consisted only of sand and no reef was present. Conversely, the north La Jolla Shore beach has no reef associated with it and no kelp beds are present within the nearshore area. The addition of 3000 cubic yards in roughly 900 sq. feet at mean sea water level and above will add about 1/2 to 1 foot of additional material to the beach. The addition of this material will not have an impact to the existing beach and benthos at north La Jolla Shores.

The only existing impacts that may occur are to the California Grunion and the California Least Tern. This project will not impact the grunion or the tern, because the project would be completed between the dates of October 1 – April 1. Additionally, there is no record of Least Terns using either beach for nesting in recent times. Because this project will occur during the non-breeding seasons for both species, no impacts will be expected.

If you have any further questions please don't hesitate to call.

Sincerely,


Doug Gibson
Marine Biologist