

## CALIFORNIA COASTAL COMMISSION

SAN DIEGO AREA  
7575 METROPOLITAN DRIVE, SUITE 103  
SAN DIEGO, CA 92108-4402  
(619) 767-2370

## RECORD PACKET COPY

**WE 5**

Submitted: July 23, 2003  
Staff: EL-SD  
Staff Report: January 20, 2004  
Hearing Date: February 18-20, 2004

**STAFF REPORT: REVOCATION REQUEST**

Application No.: R-6-01-129

Applicant: SeaWorld of California

Agent: Patrick Owen

Description: **(APPROVED SEPTEMBER 9, 2002)** Construction of a splash down water ride, consisting of three towers (95, 89 and 83 feet high), interior and exterior sets with water effects, a 130,000 gallon exhibit tank for up to ten Commerson Dolphins, a gift shop, a snack stand, restrooms, and several accessory structures, located on approximately 5.5 acres along and within the southern border of the enclosed theme park, east of the visitor entrance and adjacent to the main parking lot.

Site: 500 SeaWorld Drive, Mission Bay Park, San Diego, San Diego County.  
APN 760-037-01

Persons Requesting Revocation: Sabrina Venskus, California Earth Corps

Substantive File Documents: SeaWorld Master Plan, its EIR, and associated CCC staff reports; Mission Bay Park Master Plan, its EIR, CCC staff reports; all documents listed in the attached memo from Dr. Mark Johnsson, Staff Geologist

**SUMMARY OF STAFF RECOMMENDATION**

This item was originally scheduled for the September 2003 Commission meeting in Eureka, California. At that time, the Commission raised a number of questions, and continued the matter to a later meeting. Staff recommends that the Commission deny the request for revocation on the basis that no grounds exist for revocation under Section 13105(a) of the Commission's regulations, the only section relied upon by the parties requesting revocation. Although there may always be some degree of uncertainty over the full history of the SeaWorld/South Shores portion of Mission Bay Park, based on review of numerous reports, studies, photographs and other documents, and in consultation with the Commission's Water Quality, Geology and Mapping Units, staff concludes that there is adequate and consistent evidence to support its recommendation. In addition, the City's Local Enforcement Agency, state Regional Water Quality Control Board and state Department of Toxic Substance Control confirm that the area, including

the nearby Mission Bay Landfill, is being appropriately and adequately monitored at this time and is in conformance with all applicable regulations. They all maintain that the splashdown ride site poses no threat to life or health.

The general topic of the landfill was extensively discussed during the Commission's review of the SeaWorld Master Plan in February, 2002. The main concern of the persons requesting revocation is that a January, 2002 Soil Vapor Study conducted for a site adjacent to the splash down ride location showed one very high count of hydrogen sulfide fifteen feet underground at one test well. The test well registering the very high level of hydrogen sulfide is only a few feet from the known landfill boundaries, but hundreds of feet from the ride site. Moreover, the hydrogen sulfide was found at a depth of fifteen feet, not at or near the surface. The Commission's, and other, technical experts agree that landfill gases, consisting primarily of methane and hydrogen sulfide, disperse by orders of magnitude as they near or exit the surface. The remainder of the opponents' contentions address potential errors in the application form and the absence of some reports and discussion of landfill/toxic waste dump issues in the permit findings.

However, this issue was discussed at length during the public hearing for the SeaWorld Master Plan that occurred just seven months prior to the permit hearing and at which the Commission approved in concept the development subject to this permit. Moreover, the applicant was not required or expected to provide information on this topic in connection with this application, there is no evidence of intentional withholding of the information, and there is no reason to believe that the Commission would have acted differently had it been presented with that information.

In addition, ongoing monitoring of the landfill and adjacent areas, including the splashdown ride site, have not identified any current dangers to life or health. Over the past several years, during master planning and permit application preparation, numerous studies have been conducted on the project site, the adjacent areas, and within the known limits of the landfill. Studies have included soil gas testing, groundwater testing, subsurface testing for landfill materials and chemical constituents, and construction monitoring of excavation for the ride foundations, specifically testing for any harmful gas releases. All results have been either non-detect or within applied maximum safety levels for the various constituents. There is no evidence that any pertinent information was deliberately withheld by the applicant. Staff acknowledges that it may never be known with absolute certainty what amounts and types of materials were deposited in the general area over the past sixty or more years.

**PROCEDURAL NOTE:** The California Code of Regulations, Title 14 Division 5.5, Section 13105 states that the grounds for the revocation of a coastal development permit (or permit amendment) are as follows:

Grounds for revocation of a permit shall be:

- a) Intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application, where the Commission finds that accurate and complete information would have caused the Commission to require additional or different conditions on a permit or deny an application;
- b) Failure to comply with the notice provisions of Section 13054, where the views of the person(s) not notified were not otherwise made known to the Commission and could have caused the Commission to require additional or different conditions on a permit or deny an application.

In addition, Section 13108(e) provides that if the Commission finds that the request for revocation was not filed with due diligence, it shall deny the request.

#### **REQUESTOR'S CONTENTION:**

The request for revocation contends that grounds for revocation in Section 13105(a) exist because the applicant submitted inaccurate, erroneous or incomplete information to the Commission in the coastal development permit application with regard to three issues, and that the submittal of accurate information would have led the Commission to deny the project. The three issues are the following:

(a) The first allegation is that the applicant failed to disclose a January, 2002 soil vapor study which indicated a severe health risk from hydrogen sulfide gas in an area close to the proposed ride location. The study was prepared for the applicant and was thus in the possession and knowledge of the applicant before the Commission acted on the subject permit application. According to the persons requesting revocation, geological conditions at the site make the threat more significant, as seismic activity could cause subsidence.

(b) The second allegation is that the applicant failed to disclose studies and reports indicating the existence of an unlined and unfenced Class I hazardous waste dump underlying the SeaWorld leasehold. An industrial Class I hazardous waste dump had been operating in and around the ride location, and the exact dump boundaries are unknown. According to the persons requesting revocation, numerous existing reports and studies addressing the toxic hazardous waste dump were not disclosed to the Commission with the coastal development permit application for the ride, and the staff report does not mention the dump. The applicant was aware, prior to Commission action on this permit, that a Technical Advisory Committee had been formed by the City Council to investigate the dump boundaries and any ongoing or potential leakage.

(c) The third allegation is that the applicant failed to disclose the existence of habitat areas in or near the proposed development and areas of state or federally listed rare, threatened or endangered species. According to the persons requesting revocation, the project site is approximately 50 yards south of Pacific Passage, a primary least

tern foraging area. Lights, noise and activity associated with the ride would interrupt and discourage use of the habitat. The site is approximately 120 yards north of a least tern nesting site, and the ride structure will obstruct the direct line of flight between the nesting and foraging areas. The project is approximately 250 yards north of the San Diego River Estuary and approximately 350 yards north of Famosa Slough, both functioning wetlands harboring listed species. Additional traffic and parking generated by the ride could increase stress and displace sensitive species. These concerns are not mentioned in the staff report.

**STAFF RECOMMENDATION:** Staff recommends that the Commission **deny** the request for revocation because the persons raising objections have not met the test of section 13105 of the California Code of Regulations.

**MOTION** : I move that the Commission grant revocation of Coastal Development Permit No. 6-01-129.

The staff recommends a **NO** vote on the motion. Failure of this motion will result in denial of the request for revocation and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of Commissioners present.

**RESOLUTION TO DENY REVOCATION:**

The Commission hereby denies the request for revocation of the Commission's decision on Coastal Development Permit No. 6-01-129 on the grounds that there was neither:

- (a) Intentional inclusion of inaccurate, erroneous or incomplete information in connection with the coastal development permit application, where the Commission finds that accurate and complete information would have caused the Commission to require additional or different conditions on the permit or deny the application.

nor

- (b) failure to comply with the notice provisions of Section 13054 of the Commission's Regulations, where the views of the person not notified were not otherwise made known to the Commission and could have caused the Commission to require additional or different conditions on the permit or denied the application.

---

**STAFF NOTE:**

A revocation of a permit rescinds a previously granted permit. Even if the applicant has undertaken construction of the project, if the Commission revokes the permit, the applicant is required to stop work and if wishing to continue, to reapply for a coastal development permit for the project. If the evidence shows that there are grounds for revocation, the Executive Director, upon receipt of a request for revocation, can order the



project to stop work. Section 13107 provides, in part: "Where the executive director determines, in accord with Section 13106, that grounds exist for revocation of a permit, the operation of the permit shall be suspended." In this case, the Executive Director has not determined that grounds exist for revocation and the operation of the permit is not suspended.

Because of the impacts on an applicant, the grounds for revocation are necessarily narrow. The rules of revocation do not allow the Commission to have second thoughts on a previously issued permit based on information that comes into existence after the granting of the permit, no matter how compelling that information might be. Similarly, a violation of the Coastal Act or the terms and conditions of a permit or an allegation that a violation has occurred are not grounds for revocation under the California Code of Regulations. **The grounds for revocation are, of necessity, confined to information in existence at the time of the Commission's action.**

## II. Findings and Declarations.

The Commission finds and declares as follows:

**A. Detailed Project Description/Location.** The subject permit authorized construction of a new attraction within the existing SeaWorld theme park consisting of a splash down water ride themed as the Lost City of Atlantis. The ride is proposed as a multi-structure, and multi-level, complex, and is near completion at this time. Testing of the ride mechanics will begin shortly, and the ride is expected to open to the public on Memorial Day weekend. The primary structures include one building with three towers (83, 89 and 95 feet in height), interior and exterior sets with water effects, and a 130,000 gallon exhibit tank for up to ten Commerson Dolphins. Accessory structures include a gift shop, snack stand, restrooms, and various operation and maintenance structures. The ride would be located on approximately 5.5 acres within the southern border of the developed theme park, east of the visitor entrance and adjacent to, and within, the main parking lot. SeaWorld is located within Mission Bay Park in the City of San Diego. It is situated adjacent to Mission Bay and is surrounded largely by City parklands consisting of grassy, open areas and roadways.

This was the first application for development under the new SeaWorld Master Plan Update, which the Commission voted to certify in February, 2002. The new master plan addresses build-out of SeaWorld over the next 15-20 years, and is divided into Tier 1, Tier 2 and Special Projects. The splash down ride is a Tier 1 project, and was described in detail in the master plan. An EIR was prepared, circulated for public review and approved by the City of San Diego for the master plan, which looked at the overall plan but also analyzed potential impacts and mitigation requirements for the identified Tier 1 projects. In approving the Master Plan as an LCP amendment, the Commission certified the plan with a number of suggested modifications. One modification was to relocate the splash down ride from the proposed master plan site on the bayfront to an area more within the developed areas of the park. This was done primarily to limit adverse impacts to views from public recreational areas outside SeaWorld, and also because the proposed

master plan location did not provide an adequate setback from the riprapped shoreline of Mission Bay. The certified location occupies an area along the southern perimeter of the enclosed theme park, encroaching slightly into the existing main parking lot. Before the beginning of construction, this area was entirely paved.

**B. Summary of Revocation Request's Contentions.** The revocation request has been filed by Sabrina Venskus, representing California Earth Corps. Although their contentions are summarized below, the full text of the revocation request and attachments are included as Exhibit #1.

The revocation request (Exhibit #1) asserts that intentional inclusion of inaccurate, erroneous or incomplete information which, if known to the Commission, would have caused different conditions or denial of the permit are grounds that exist for the revocation of this permit. In summary, the allegations are: 1) that the applicant failed to disclose a January, 2002 soil vapor study which indicated a triple checked detection of over 1,820 ppm of hydrogen sulfide gas in a test well approx. 315 ft. from the Ride, and, the close proximity of the test well to an intense public use area such as the proposed Ride is extraordinarily significant, given the nearby incident involving H<sub>2</sub>S poisoning caused the death of one person and hospitalization of eight others in 1988; 2) that the applicant knowingly failed to disclose that an industrial Class I hazardous waste dump had been operating in and around the location of the Ride, and that the exact boundaries of the toxic hazardous waste dump are unknown; also, the applicant did not disclose studies and reports indicating the existence of the toxic hazardous waste dump, the staff report does not mention the dump, and the applicant was aware that a Technical Advisory Committee (TAC) had been formed by the San Diego City Council to address the boundaries of the dump vs. the City landfill and to what extent the dump's chemicals are leaking and migrating; and 3) that the applicant failed to disclose the existence of sensitive habitat areas in or near the proposed development and areas of state or federally listed rare, threatened or endangered species.

The contention notes that these concerns are not mentioned in the staff report, and the various supporting documentation is not in the subject permit file. In addition, the contention states that a subsequent denial by the Commission of an application to pave a portion of an adjacent site directly over the landfill/toxic waste dump for use as a parking lot proves the Commission would have denied the ride if the 2002 Soil Vapor Study, and other documentation, had been provided at the time. The contention does not allege that grounds for revocation exist pursuant to Section 13105(b) for failure to comply with notice requirements.

**C. Analysis of the Revocation Request's Contentions with Respect to Section 13105(a) of the California Code of Regulations.** As stated, the grounds for revocation are, of necessity, confined to information in existence at the time of the Commission's action. In this case, the Commission approved the subject permit on September 9, 2002. The three elements that must be proved before a permit can be revoked under Section 13105 (a) are:

- That the applicant provided inaccurate, erroneous or incomplete information,

- That the inaccurate, erroneous or incomplete information was supplied knowingly and intentionally, **AND**
- That if the Commission had accurate and complete information at the time it approved the application, it would have required additional or different conditions or denied the application.

**D. Intentional Inclusion of Incomplete or False Information Provided by Applicant.** The contention raised in the revocation request alleges the intentional inclusion of incomplete or false information as a grounds for revocation. The following analysis concludes that there are no such grounds for revocation of the permit:

1. 2002 Soil Vapor Study. The Commission finds no evidence that SeaWorld deliberately withheld critical information related to this study in conjunction with the splash down ride permit review. The 2002 Soil Vapor Study was prepared by IT Corporation for SeaWorld, as required by the City of San Diego Solid Waste Local Enforcement Agency, and was given to the City on January 4, 2002, and to the Regional Water Quality Control Board on January 7, 2002; it has been available for public review since that time. These are the two public regulatory agencies charged with oversight of the landfill. The report provides results and recommendations from testing conducted in October, 2001, and does not address the splash down ride site specifically, but rather an undeveloped piece of land nearby the ride site. The report concludes that the site is similar to many others in Southern California near landfills and that development can occur consistent with common engineering practices. Page 4-4 of the report lists specific recommendations, and is part of Exhibit #1A, attached.

Although the application for the splash down ride was submitted to this office in 2001, it was incomplete and held in abeyance during review of the SeaWorld Master Plan. The permit application file included a geological report for the then-proposed splashdown ride site, which was also part of the master plan review. The original planned site covered portions of the 16-acre expansion area and was adjacent to the Mission Bay shoreline. However, certification of the master plan included relocation of the splash down ride to a less prominent area of the leasehold and outside the 16-acre expansion area. Thus, when the master plan was certified, the applicant provided new plans for the ride in the location approved by the Coastal Commission. On May 10, 2003, the application was filed and scheduled for Commission action. SeaWorld did not submit new geological studies because the relocated site had also undergone geologic review in the master plan as the future site for an expanded events center. In processing building permits for the ride, the City did require a new geological study, which is in general agreement with the one conducted previously for the events center.

Although the 2002 Soil Vapor Study was in existence by that time, it addresses only the SeaWorld 16-acre expansion area, and not the specific site of the splash down ride. Thus, although the Commission and its staff were unaware of the 2002 Soil Vapor Study at the time the Commission approved the subject permit, its absence from the permit file does not render the file or the information provided by the applicant "incomplete," as the report does not contain relevant information, since the report does not directly address the relocated site of the splash down ride. In sum, the failure to produce this report does not

constitute evidence of incomplete or inaccurate information. No evidence has been presented to demonstrate that the applicant intended to under-inform or mis-inform the Commission.

2. Presence of Toxic Waste Dump. The contention that the applicant intentionally provided false or incomplete information relative to the presence of the dump or related reports, or that the Commission was, in fact, unaware of the existence of the landfill and that it underlies the SeaWorld park is also not supported by the facts. This issue was widely discussed in the EIR, staff report, public testimony, and Commission discussion at the time of SeaWorld's Master Plan certification in February, 2002. That review included not only the master plan document, but an analysis of all the Tier I developments in the plan. The splash down ride received a great deal of attention at the public hearing, since staff was recommending it be relocated further from the water, and since both the public and the Commission recognized it as a very significant project that would be coming back to the Commission for permit approval in short order. In fact, the Commission approved the CDP for the ride only seven months after it acted on the master plan. The fact that the staff did not raise the same concerns again with the permit review was because the core issues of the ride had been resolved through the master plan certification process. Likewise, staff did not require the applicant to resubmit all the background materials with the permit application that had already been received and reviewed with the master plan. Staff did cite the Mission Bay Precise Plan, SeaWorld Master Plan, and EIRs for both plans, as substantive file documents in the permit staff report.

The revised findings for the City of San Diego LCP Amendment No. 2-2001-C (Sea World Master Plan) state the following:

"A portion of the eastern Sea World leasehold is underlain by the inactive Mission Bay Landfill. The City of San Diego operated the landfill from approximately 1952 until 1959. The landfill reportedly accepted municipal solid waste and some liquid industrial wastes (including acids, alkaline solutions, solvents and paint wastes). The U.S. Environmental Protection Agency estimates that up to 737,000 gallons of industrial wastes may have been disposed at the landfill during its operation. After closure of the landfill, dredged material from Mission Bay (consisting of mostly fine-grained material) was placed on top of the former landfill surface to a depth of approximately 15 feet. A portion of the site is currently paved with a chip-seal paving surface which allows for diffusion of landfill gasses while remaining impervious to water infiltration.

Several investigations of the landfill were conducted to evaluate the extent of potential chemical contamination. Samples for chemical analysis were collected from soils, surface water, sediments and groundwater from the landfill and surrounding areas. Investigations detected a number of chemicals in onsite soils and groundwater including heavy metals, volatile and semi-volatile organic compounds and chlorinated pesticides. In 1985, the Regional Water Quality Control Board (RWQCB) adopted Order No. 85-78, which required, among other things, routine

monitoring of groundwater, surface water and sediments from Mission Bay and the San Diego River. In addition to routine monitoring, several additional soil and groundwater investigations were conducted in and around the landfill through 1997. The results of these investigations and continued routine monitoring indicate that low levels of chemicals were detected in soils and groundwater beneath and adjacent to the landfill. According to the RWQCB, these low levels of chemicals do not represent a significant threat to public health or the environment. Furthermore, the California Department of Toxic Substances Control (DTSC) and U.S. EPA previously evaluated the site in 1987 and 1993, respectively, and determined that the site did not pose a significant threat (see attached letters from the DTSC and RWQCB).

The RWQCB continues to be the lead agency for oversight for water quality issues at the Mission Bay Landfill. The City of San Diego continues to monitor the site in accordance with RWQCB Order 97-11, General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills. Routine monitoring has detected low levels of several chemical constituents in groundwater beneath and adjacent to the site. However, the concentrations of these chemicals have been well below any of the established action levels identified by the RWQCB, and do not appear to represent a significant threat to public health or the environment. The site is currently in compliance with the requirements of the City of San Diego Solid Waste, the RWQCB, and California Integrated Waste Management Board.

Commission staff has received public comments related to the presence of contaminants in groundwater beneath the landfill and the potential for migration of these chemicals offsite. The Commission's Water Quality staff has reviewed the available monitoring data regarding groundwater conditions at the Mission Bay Landfill. Staff concludes that data supports the determinations by the regulatory agencies overseeing the landfill that the low levels of chemicals detected do not represent a significant threat to public health or the environment. The same public comments were submitted during the comment period for the *Draft Environmental Impact Report for the Proposed Sea World Master Plan Update (EIR)*, dated March 12, 2001. These comments and related issues were fully and adequately analyzed by the lead agency in the Final EIR."

At time of review of the master plan and the ride application, the Commission was aware the landfill was alleged by members of the public to be a toxic waste dump. Submitted studies and documents, including but not limited to, the *Site Inspection Prioritization* prepared by Bechtel Environmental, Inc. in 1993 and the *Assessment Report SeaWorld Lease Expansion* prepared by Fluor Daniel GTI in 1997 acknowledged the Mission Bay Landfill had been the recipient of up to 737,000 gallons of various industrial wastes, including waste acids, alkaline solutions, organic solvents and paint wastes. These reports are part of a binder submitted by SeaWorld during the master plan review. Two of the other documents in the binder include a lease amendment and the *Post Closure Land Use Plan for Mission Bay South Shores Phase III*. When this volume of material is

already on record at the Commission office, it is not usual for copies of all such data, monitoring results, studies, etc. to again be submitted as part of a subsequent permit application. Thus, the failure to re-submit this information did not constitute providing incomplete or inaccurate information. In addition, it was acknowledged there is some degree of uncertainty in the exact boundaries of past waste disposal operations at the Mission Bay Landfill. One of the objectives of the Technical Advisory Committee (TAC) is to investigate more closely the boundary of the landfill.

In its review of issues surrounding the presence of an historic landfill that contains hazardous materials, the Commission must rely on the expertise of the number of agencies who have direct jurisdiction over control of discharges and emissions, both solid and gaseous, on land and in air and water, to reach conclusions regarding the presence of public health risks. As indicated in the attached correspondence from the City of San Diego Environmental Services Division and the Regional Water Quality Control Board (RWQCB), these agencies were aware, at the time of approval of the Splashdown Ride, of the results of the soil vapor assessment discussed in the January 2002 study and the ongoing efforts of the TAC to further investigate the limits of the landfill and potential need for remediation. However, there is no indication that the continued buildout of SeaWorld park in the already developed portion of the leasehold, and not the site of the historic landfill, poses any risk to health and safety of the park users. Also attached is correspondence from the Department of Toxic Substance Control (DTSC), which drew similar conclusions.

These materials, along with numerous studies and other documentation, have been reviewed by the Commission's staff geologist, whose full comments are attached. To briefly summarize his comments and conclusions, geotechnical borings that penetrate landfill material in the South Shores area clearly indicate the presence of the known Mission Bay landfill. Similar geotechnical borings, and construction excavations for the splashdown site, do not identify landfill materials at that site. The borings and excavations undertaken to date at the splashdown site are sufficient to conclude, with a high level of confidence, that the landfill does not extend beneath the ride site. In addition, no appreciable levels of ground water contamination were found in the area of the Splashdown ride. Thus, it is very unlikely that hazardous wastes underlie the site. The ground water evidence further suggests that the hazardous wastes that almost certainly exist within the landfill have not migrated to the area of the Splashdown ride. High levels of methane and hydrogen sulfide are associated with the landfill, and it is possible, but very unlikely, that these gasses could migrate laterally along porous soil layers to the splashdown site. There is no evidence that this has occurred to date, and no such migration of hazardous gasses has ever been reported during any earthquake.

Further, as part of the review by the TAC, the City Environmental Services Division has contracted with SCS Engineers to reevaluate the existing monitoring program and perform a full assessment to determine if the landfill poses a threat to the public or the environment. The scope of the work includes: 1) review of all previous investigations performed on the site; 2) development of a Site Assessment Plan (SAP) identifying the potential chemicals of concern and appropriate screening criteria; 3) implementation of

the approved SAP; and 4) preparation of a final Site Assessment Report including recommendations if warranted. It is anticipated that implementation of an approved SAP will begin in 2004 with a final report expected possibly as early as July 2004.

In addition, even if there were additional items that the applicant could have presented in connection with this application, the party requesting revocation has presented no evidence that the applicant's failure to provide such items was intentional or designed to limit the information to which the Commission had access in connection with its review of this project.

3. Proximity to Sensitive Habitats. The third allegation is that the Commission was unaware of the existence of sensitive habitats and listed species in the general vicinity because the applicant intentionally withheld the information. This allegation is also not substantiated. These matters were discussed extensively during the master plan review, and in relation to several past CDPs for SeaWorld projects. The presence of sensitive floral and faunal resources in the general area was one reason the ride was relocated further from the water's edge. Moreover, although these resources do exist throughout various parts of Mission Bay Park, their distance from the splash down ride location exceeds the Commission's typical buffer requirements. There are fully functioning wetlands in the Southern Wildlife Preserve south of SeaWorld, at a distance of about 1,200 feet from the splash down ride construction site. It appears that the numbers given in the request for revocation are incorrect, as scaled plans of the area indicate a much greater distance between the ride and the identified sensitive features.

In addition, there are two designated least tern nesting sites, one located across Pacific Passage to the north (inactive for many years), and the other located between SeaWorld Drive and the Southern Wildlife Preserve south of SeaWorld (also inactive). These are located approximately 2,000 feet north and 600 feet south of the splash down ride site, respectively. The closest active least tern nesting sites are all a mile or more from SeaWorld. In addition, even if there were additional items that the applicant could have presented in connection with this application, the party requesting revocation has presented no evidence that the applicant's failure to provide such items was intentional or designed to limit the information to which the Commission had access in connection with its review of this project.

4. Incomplete Filing Materials/Application. California Earth Corps has contended that SeaWorld's intent to supply incomplete or false information is proven by some of the responses in the application form. In particular, any updated geology reports and the 2002 Soil Vapor Report were not submitted as required in the application. The other contention is that the applicant responded "no" to questions of whether the site is within or nearby sensitive resources. With respect to the first issue, the identified reports did not exist at the time the application was submitted. When SeaWorld completed the file with updated plans, Commission staff was unaware of the Soil Vapor Study and additional information about the location of the landfill. However, since the ride site is separated from the assumed landfill boundaries by a wide paved parking lot, this information would not have been considered pertinent to the specific splashdown ride permit application.



The 2002 Soil Vapor Study is for a different, though nearby, site. The updated geology report is a requirement of the master plan prior to the issuance of building permits.

With respect to the questions about sensitive resources, no such resources exist on the ride site itself, or elsewhere within the developed portions of the SeaWorld leasehold. Whether or not SeaWorld is "near" such resources is subjective. Since it has been shown that the ride site is not within what would typically be a buffer zone, the Commission finds the "no" answer reasonable, and finds it does not represent a deliberate intent to deceive. In addition, even if there were additional items that the applicant could have presented in connection with this application, the parties requesting revocation have presented no evidence that the applicant's failure to provide such items was intentional or designed to limit the information to which the Commission had access in connection with its review of this project. Thus, failure to produce additional documentation addressing biological resources does not constitute incomplete or inaccurate information.

**E. Effect of Complete and Accurate Information on the Commission Action.**

The question of whether additional information along the lines discussed above would have swayed the Commission's decision on the subject permit is as significant as whether a lack of disclosure of all material was intentional or not. Earlier reports submitted with the master planning documents included the results of a significant amount of soil and water testing, including acknowledgement that both methane and hydrogen sulfide gases were present on the nearby landfill site. However, these reports did not indicate any existing public danger due to the low concentrations of these substances. Thus, the Commission was well aware of the existence and contents of the landfill when it approved the subject permit. The only additional information provided in the 2002 Soil Vapor Study was that one test well had produced an abnormally high reading for hydrogen sulfide during one test. The report itself goes on to state that this was either an anomaly or the result of a deposit of sulfur materials close to the probe, which took the sample from 15 feet underground, not on the ground surface. The report does not conclude that any immediate human health hazard exists at the site of the splashdown ride, and monitoring for landfill gases continues at this time as recommended. The Commission's Water Quality Unit has reviewed the Soil Vapor Study, and does not feel that public health concerns were raised by its findings.

California Earth Corps claims that the Commission was not aware of the 2002 report when it acted on the splash down ride, but was aware of it when the Commission subsequently denied a permit application for paving a portion of the nearby expansion area. California Earth Corps contends that this information was pivotal in the Commission's action to deny Coastal Development Permit #6-03-006 for the parking lot. In reviewing the file and listening to the hearing tapes, there is nothing to indicate that the 2002 Soil Vapor Study was relied on in the Commission's decision to deny the permit. The report was not part of the file itself, and only one public speaker testified at the hearing; the report was not mentioned in that testimony, nor in any of the subsequent Commission discussion prior to the vote to deny. The Commission was aware of the Technical Advisory Committee (TAC) that is conducting current tests and studies

through reference in the staff report, and also felt that solutions other than capping the landfill with pavement might be more appropriate. It was also pointed out that most of the parking lot area was not required by SeaWorld immediately, but was intended to serve future development. This being the case, the Commission denied the application, with the intent that results and recommendations from the TAC would be available before the Commission reviewed the parking lot proposal again.

Thus, the Commission's denial of CDP #6-03-006 was not based on the 2002 Soil Vapor Study. Moreover, that proposal was for improvements directly over the landfill on area that had not previously been improved. The subject permit for the splash down ride is in a location not over the mapped landfill boundaries, and in a location already surfaced and used as a parking lot and portions of the improved theme park. Moreover, a significant portion of the existing parking lot remains between the approved ride site and the landfill.

The Commission must rely on the expertise of the agencies having direct jurisdiction over control of discharges and emissions to reach conclusions regarding the presence of public health risks. The City of San Diego Environmental Services Division and the Regional Water Quality Control Board (RWQCB) were aware, at the time of approval of the Splashdown Ride, of the results of the Soil Vapor Study, as was the Department of Toxic Substance Control (DTSC). All the same materials, and others have been reviewed by the Commission's staff geologist, whose conclusions were similar to those of the other agencies. He felt adequate testing was done to determine if landfill materials exist, and none were found at the splashdown site. Groundwater testing showed no evidence of significant contamination and he concluded that neither the landfill, nor hazardous wastes, appear to underlie the splashdown ride site.

The Soil Vapor Study did include list of recommendations for future development in this general area to comply with Title 27 regulations. The applicant has indicated that all recommendations were incorporated into the final splashdown ride design. Moreover, the Soil Vapor Study was required by those agencies responsible for assuring compliance with those regulations, and said agencies have indicated that SeaWorld is in full compliance. The Commission finds nothing in this study that would suggest that its inclusion in the permit review would have led to any different outcome than the Commission's September 9, 2002 approval with conditions.

Finally, even if there were additional items that the applicant could have presented in connection with this application, the parties requesting revocation have presented no evidence that the applicant's failure to provide such items was intentional or designed to limit the information to which the Commission had access in connection with its review of this project. Therefore, there is no evidence of intentional inclusion of inaccurate or incomplete information, or that such inaccurate or incomplete information, had it been corrected or completed and presented to the Commission, would have caused the Commission to impose different conditions or deny the project.

**F. Analysis of Photographic Evidence.** In addition to the correspondence, studies, maps, etc., much of the requester's evidence is in the form of aerial photographs.

These have been examined by the Commission's mapping unit and also reviewed by various Commission staff members in the San Diego and San Francisco offices. Specific comments from the mapping unit are attached, and the following discussion summarizes staff's review of the pictures.

Although a great deal of photographic evidence was presented to Commission staff over the past few months, this analysis concentrates on the seven photos that were given to the Commission at the September 11, 2003 meeting in Eureka. These photos span the years between 1941 and 1958, thus including the World War II years, post-war years and the years the landfill was known to be in active, formal use. The earlier photos indicate that some type of ground disturbance occurred west of the identified landfill site and well within what would become the SeaWorld leasehold. This was many years before the identified landfill east of the site began operations in the early 50's. Unfortunately, the scale and quality of the photos make it impossible to determine with certainty what activity is taking place on the subsequent SeaWorld site.

Pre-existing uplands in this general location supported an airfield and racetrack, and possibly some military uses. During this same range of years, the land and channel portions of Mission Bay Park as a whole were being created, and the San Diego River was being redirected and channelized. Huge amounts of hydraulic materials were being dredged from the new river bed; these were placed to form the park's additional upland areas and islands. SeaWorld/South Shores and Fiesta Island were the last parts of the park to be fully formed. Dredging and filling activities continued in these locations after they had ceased elsewhere in the park, right through the official landfill years and into the early 60's. Whether the activities seen in the earlier photos show land disturbed by dumping or land disturbed by dredge and fill operations is very difficult to say and may never be fully resolved.

Although the old photos are interesting and somewhat informative, the scale and, in some cases lack of clarity, leave them open to a variety of interpretations. Therefore, the Commission finds the more compelling evidence to be the laboratory results of various geotechnical, soils, air and groundwater studies taken over the last several years. Although it is clear from the pictures that some sort of activity occurred in the area that is now SeaWorld, there is no evidence at this time that any toxic or hazardous materials underlie the splashdown ride site. Borings taken from areas within the known landfill include waste and landfill debris; borings taken at the splashdown ride site do not. In addition, excavation for the ride's foundation went to a depth of 25-30 feet; although mechanical and hydraulic fill materials were encountered, waste and landfill debris were not. Moreover, the public agencies with jurisdiction over dumps and landfills have determined there is no threat to life or property associated with the splashdown ride site. The staff geologist concurs with this determination, as evidenced by his attached findings.

**G. Section 13105(b) of the California Code of Regulations.**

Section 13105(b) of the Commission's regulations provides an alternative ground for the revocation of a permit, related to an applicant's failure to comply with the Commission's

noticing requirements. However, the parties requesting revocation did not allege any such failure as a basis for revocation, and the Commission is aware of no evidence that such a failure occurred. Therefore, there is no basis for revocation of the permit pursuant to the grounds listed in Section 13105(b).

**H. Conclusion.** The revocation request does not demonstrate that the applicant knowingly and intentionally provided inaccurate, erroneous, or incomplete information. Thus, the grounds necessary for revocation under Section 13105(a) of the Regulations have not been met. In addition, there is no claim or evidence of grounds for revocation under Section 13105(b). The Commission finds that the revocation request shall be denied because the contentions raised in the revocation request do not establish the grounds identified in Sections 13105 (a) or (b) of the California Code of Regulations.



TELEPHONE: (310) 581-1180  
FACSIMILE: (310) 581-1183

SABRINA VENSUS  
ATTORNEY AT LAW  
171 PIER AVENUE, SUITE 204  
SANTA MONICA, CALIFORNIA  
90405

EMAIL:  
VENSUS@LAWSV.COM

Peter Douglas  
Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, CA 94105-2219

July 21, 2003

RECEIVED

RECEIVED  
JUL 22 2003

JUL 23 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

CALIFORNIA  
COASTAL COMMISSION

RE: Request and Petition For Revocation of Coastal Development Permit No.  
6-01-129 (Sea World Adventure Park, Splash Down Ride)

Dear Mr. Douglas,

California Earth Corps is a non-profit organization whose mission is to bring about environmental justice through actions to suppress toxicant releases, toxic insult to the environment, toxic tort and chemical battery, especially to people of color and poverty, to champion equal use and access to Public Lands, especially the Coastline, and to defend Public Trust Doctrine as it applies to tidelands, rivers, lakes and streams. California Earth Corps ("Earth Corps") hereby requests the California Coastal Commission ("Commission") revoke the above-cited permit ("Ride") issued to Sea World San Diego ("Applicant") pursuant to Cal. Pub. Res. Code §30331 and 14 Cal. Code Reg. §§13104-13108.5.

I. Background

Sea World is located in Mission Bay Park, which is a dedicated public park with Sea World as a designated lessee. On August 8, 2001, the Applicant submitted to the Commission an application for development of the Ride at a shoreline location near the northeast corner of the park. The application was scheduled on the Commission's July 9, 2002 meeting agenda but the applicant requested the matter be postponed. On February 7, 2002, the Commission approved Sea World Master Plan LCP amendments subject to 36 conditions and modifications, one of which relocated the Ride to a location near the Sea World parking lot along the inner park edge just east of the hospitality center.

On May 10, 2002, the Applicant re-filed the Coastal Development Permit application for the relocated Ride. On September 9, 2002, the Commission approved the application. In January, 2003, the City certified the EIR for the Sea World Master Plan Expansion.

EXHIBIT NO. 1  
APPLICATION NO.  
6-01-129  
Revocation Request

In May, 2003, Earth Corps, along with other NGOs, became aware of an unlined and unfenced Class I hazardous waste dump underlying the Sea World park. Additionally, in May 2003, Earth Corps came into possession of documents that indicated a severe health and safety hazard at the development site. The documents were apparently withheld from the Commission in its consideration of the application for the Ride permit. These documents were in the possession of the applicant before and during the Commission's consideration of the Ride application, yet they were withheld from the Commission.

Furthermore, it appears that the Applicant failed to divulge significant information regarding sensitive habitat and endangered species in its Coastal Development Permit application.

## II. Grounds For Permit Revocation

Section 13105(a) of the California Code of Regulations requires revocation of a coastal development permit where an applicant has intentionally included inaccurate, erroneous or incomplete information in connection with a coastal development permit application and where the Commission finds that accurate and complete information would have caused the Commission to require additional or different conditions on a permit or deny the application.

## III. The Applicant Intentionally Excluded Material and Relevant Information From The Commission

Relevant and material information which the Applicant intentionally excluded from the Commission's review and consideration regarding the Ride permit includes: (1) a technical report indicating hazardous conditions at or near the site, (2) reports and studies documenting an unlined and unfenced Class I hazardous waste dump underlying an unknown expanse of the Sea World leasehold, and (3) disclosure of sensitive habitat areas in or near the proposed development, and disclosure of areas of state or federally listed rare, threatened or endangered species.

### **A) A technical report indicating hazardous conditions at or near the Ride, issued in January, 2002, entitled: "Results of Soil Vapor Assessment Sea World Expansion Plan, 16-acre Tract" ("January 2002 Study").**

The January 2002 Study's subject location is the eastern area of the guest parking lot, which is adjacent to the Ride location. The report indicates a triple checked detection of over 1,820 parts per million (ppm) of hydrogen sulfide (H<sub>2</sub>S) gas in a test well within the guest parking lot. (Exhibit A). The test well, J-24, is only approximately 315 feet from the location of the Ride location's boundary. (See Map, Exhibit B). The close proximity of test well J-24 to an intense public use area such as the proposed Ride is extraordinarily significant, given that a nearby incident involving H<sub>2</sub>S poisoning caused the death of one person and hospitalization of eight others in 1988. Specifically, one



workman died and eight workmen were injured while digging the foundation for a South Shores boat launch ramp. The cause of the death and injuries was H<sub>2</sub>S poisoning. (Exhibit C). The boat launch ramp is farther away from the J-24 well than that of the Ride development.

This information is significant because it suggests that there is a severe health and safety risk associated with both building and operating the Ride. H<sub>2</sub>S is a potentially lethal gas. If inhaled, an extreme hazard exists at 10ppm and is potentially lethal at 100ppm. (Exhibit D).

Geological conditions at the site make the H<sub>2</sub>S threat much more significant than might be under other circumstances. The area is prone to liquefaction, near fault zones, and contains loose, unconsolidated fill which allows gases and liquids to migrate and move easily. These combined characteristics make for a potentially dangerous release of H<sub>2</sub>S gas up the Ride's pilings and foundations or other pathways. An earthquake or other geological incident could cause subsidence of the unconsolidated fill, collapsing the soils, cracking pavement and forcing toxic gas into the air. (Exhibit D).

In short, the January 2002 Study containing information about high levels of H<sub>2</sub>S near the Ride's perimeter should have been disclosed to the Commission. The applicant was legally required to give the Commission this information so that the Commission could consider the potential effects associated with H<sub>2</sub>S contamination and development of the Ride on coastal resources.

Proof of the Applicant's intent to include incomplete information is demonstrated by the following facts:

- 1) The Applicant did not disclose in its permit application the January 2002 Study even though Section II, Question #8 of the application specifically requested listing of any geologic or other technical reports. (Exhibit E). Yet this study was clearly within the possession and knowledge of the Applicant, because the cover sheet indicates it was prepared exclusively for Sea World San Diego.
- 2) The January 2002 Study was leaked to Earth Corps by a confidential informant who was gravely concerned about the continuing permitting of Sea World's expansion projects without proper disclosure of significant information.

**B) Studies and reports indicating the existence of an unlined and unfenced Class I hazardous waste dump underlying the Sea World leasehold.**

The Applicant knowingly failed to disclose that an industrial Class I hazardous waste dump had been operating in and around the location of the Ride, and that the exact boundaries of the toxic hazardous waste dump were unknown. (See Exhibit F, Cover Story, *San Diego Weekly Reader*, July 20, 2000 for in depth coverage of this matter).

Proof of the Applicant's intent to include incomplete information in the Coastal Development Permit application is demonstrated by the following facts:

- 1) The Applicant did not disclose in its permit application the studies and reports indicating the existence of the toxic hazardous waste dump even though Section II, Question #8 of the application specifically requested listing of any geologic or other technical reports. The only report disclosed was a "Report of Preliminary Geotechnical Investigation Sea World Atlantis Project," dated October 16, 2000." (Exhibit G). This report made no mention of the toxic hazardous waste dump and the geological considerations related thereto. Indeed, other relevant technical reports existed that were within the possession and knowledge of the Applicant, were clearly relevant to the Ride application, discussed the existence of the toxic hazardous waste dump, but were withheld from the Commission. (See Exhibit H, "Assessment Report Sea World Lease Expansion," prepared for Mr. Kevin Carr, Sea World of California, June 9, 1997 by Fluor Daniel GTI).
- 2) The staff report makes no mention of the Class I hazardous toxic waste dump.
- 3) The Applicant was aware at least as early as May 2002 that a Technical Advisory Committee (TAC) had been formed by the San Diego City Council to address: where are the exact boundaries of the industrial toxic waste dump (versus the City landfill); and, to what extent is the toxic waste dump's chemicals leaking and migrating?<sup>1</sup> However, the Applicant failed to disclose this extremely important and pertinent information to the Commission.

**C) Failure to disclose the existence of sensitive habitat areas in or near the proposed development and areas of state or federally listed rare, threatened or endangered species**

The applicant was in possession and had knowledge about the following facts at the time the Commission considered the Ride permit application. However, the Applicant knowingly withheld this information from the Commission:

1. The Project is approximately 50 yards south of the Pacific Passage (South Shore) of Mission Bay, a primary foraging location for California Least Tern (Sterna antillarum brownie).

This information is significant because noise, lights and activity associated with the Splash Down amusement ride would be expected to interrupt foraging and discourage use of this habitat. California Brown Pelicans, other terns and game fishes also prey on concentrations of anchovies and smelt in the shallow waters of the Passage. Eel grass beds and Tidewater Gobies were formerly present.

---

<sup>1</sup> The first official meeting of the TAC took place on August 16, 2002. A representative of Sea World, who is also a TAC member, attended.

2. The project is approximately 120 yards north of the Least Tern Nesting Site.

This information is significant because breeding birds carry fish taken in Pacific Passage in the shortest direct route to their nestlings; a route whose airspace would be blocked by the 90 foot high rollercoaster ride, forcing a longer route or different foraging or nesting site. This could have a direct impact on fledging success; hence a negative impact on total number of birds successfully fledged.

3. The project is ~250 yards north, but only across Sea World Drive from Sea World Parking Lot, from the San Diego River Estuary, a fully tidal wetland, and ~ 350 yards from the Famosa Wetlands, both highly functional salt marsh harboring at least eight listed species and occasionally host six more.

This information is significant because additional traffic and parking generated by this Ride could increase the stress and displace sensitive species.

Proof of the Applicant's intent to include incomplete information in the Coastal Development Permit application is demonstrated by the following facts:

- 1) The Coastal Development Application, Section III, question number 9 asks whether the proposed development is in or near (a) sensitive habitat areas, or (b) areas of state or federally listed rare, threatened, or endangered species. In both cases, the applicant checked the "No" box. (Exhibit E).
- 2) The staff report makes no mention of the above-referenced information regarding sensitive habitat areas and areas of state or federally listed endangered species.

IV. Inclusion Of Any of This Information Would Have Caused The Commission To Require Additional Or Different Conditions On A Permit Or Deny An Application

Disclosure of the January 2002 Study and information about the Class I hazardous waste dump would have either caused the Commission to require additional or different conditions on the permit, relocate the Ride, or deny the application altogether. This is clear by the fact that the Commission denied an application only eight months later by the same applicant based on the above-referenced information.

On May 7, 2003, the Coastal Commission denied a proposal for a 1,353 car parking lot across 10.5-acres ("Parking Lot"). At that time, members of the public had informed the Commission that a highly toxic hazardous waste dump was known to be located on San Diego's Mission Bay, underneath a portion of the Sea World leasehold. Thanks to the information provided by the public to the Commission staff, the Parking lot staff report included a detailed discussion of the dump. Staff pointed out that "Representatives of [the RWQCB] have indicated in the past that only minimal structural

improvements can occur over landfills and that capping the site with asphalt is the preferable use." Staff Report, App. No. 6-03-006, April 14, 2003, p. 5. Despite the staff's recommendation that the Commission approve the Parking Lot, members of the public pointed out that Sea World should be required to analyze and remediate the dump before it is granted a permit to pave over the site. The Commission agreed and denied the application.

In contrast to the Parking Lot staff report, the Ride staff report makes no mention of the hazardous waste dump despite the fact that the applicant knew that the relocated Ride is at least adjacent to, if not on top of, the toxic hazardous waste dump. Not surprisingly, then, the Ride staff report does not address the issue of removing the asphalt cap at the Ride location for construction of foundations for structures which range between 65 and 85 feet in height. If the Commission had known about the existence of the toxic hazardous waste dump, at the very least it most certainly would have heeded RWQCB's advice that only minimal structural improvements could occur and that capping the site with asphalt is the preferable use.

Unlike the Ride staff report, the Parking Lot staff report discusses the TAC investigation. The TAC's purpose is to determine constituents, boundaries and potential leakage of both the household landfill and the Class I toxic hazardous waste dump. The fact that the TAC investigation was ongoing was one reason why the Commission voted to deny the Parking Lot permit. In contrast, the Ride staff report makes no mention of the TAC investigation, even though the applicant knew of the TAC's existence at the time the Commission considered the Ride permit. Had the Commission been advised of the TAC's existence, mission and purpose, it would have likely determined that the TAC investigation be allowed to conclude prior to consideration of the Ride development permit at that location.

Finally, information regarding the close proximity of the proposed Ride to sensitive habitat areas and state or federally listed endangered species would have likely caused the Commission to either relocate the Ride or attach additional conditions to the permit in order to protect these areas and species from damage.

V. The Commission Executive Director Should Initiate Revocation Proceedings Immediately

The regulations require the Executive Director to review a petition for revocation and initiate revocation proceedings unless the request is "patently frivolous and without merit." 14 Cal. Code. Regs. §13106. If grounds exist for revocation of a permit, the operation of the permit shall be automatically suspended until the Commission votes to deny the request for revocation. §13107.

The Petitioner has specified with particularity the grounds for revocation of the above-cited permit. Therefore, Petitioner respectfully requests that the Executive

Mr. Peter Douglas  
Page 7 of 7

Director initiate revocation proceedings, immediately suspend the permit, and agendaize the matter on the next regularly-scheduled Commission meeting. Time is of the essence because the Applicant is racing to complete the development. Construction must be halted immediately and the Commission must be given an opportunity to consider the Ride permit based on complete and accurate information.

Respectfully Submitted,

A handwritten signature in cursive script, appearing to read 'Sabrina Venskus'.

Sabrina Venskus, Esq.  
For Petitioner California Earth Corps

cc: Ralph Faust  
Deborah Lee  
Don May

**EXHIBIT A**

# Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract

*Prepared for*

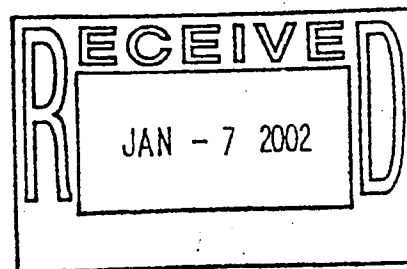
*SeaWorld San Diego  
500 SeaWorld Drive  
San Diego, CA 92109*

*Prepared by*

*IT Corporation  
1230 Columbia Street, Suite 1200  
San Diego, CA 92101*

*January 2002*

*IT Corporation Project 830418*



**IT CORPORATION**  
*A Member of The IT Group*

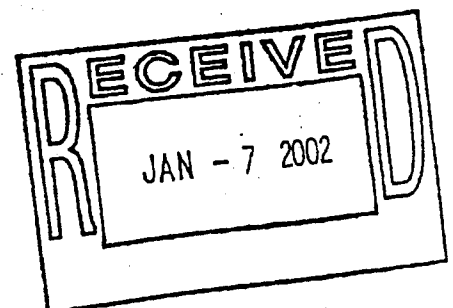


**RESULTS OF SOIL VAPOR ASSESSMENT  
SEAWORLD EXPANSION PLAN, 16-ACRE TRACT**

PREPARED FOR  
SEAWORLD SAN DIEGO  
500 SEAWORLD DRIVE  
SAN DIEGO, CA 92109

PREPARED BY  
IT CORPORATION  
1230 COLUMBIA STREET, SUITE 1200  
SAN DIEGO, CA 92101-8517

January 2002  
IT Corporation Project 830418



## Table of Contents

---

List of Tables.....	ii
List of Figures .....	ii
List of Appendices.....	ii
List of Acronyms and Abbreviations.....	iii
1.0 Introduction and Summary of Conclusions.....	1-1
2.0 Background .....	2-1
3.0 Collection and Analysis of Soil Vapor Samples.....	3-1
3.1 Soil Vapor Probe Construction.....	3-1
3.2 Sample Collection Methods .....	3-2
3.3 Analytical Methods for Soil Vapor Samples .....	3-2
4.0 Analytical Results .....	4-1
4.1 Field Analytical Results.....	4-1
4.2 Laboratory Analytical Results .....	4-1
4.3 Discussion of Analytical Results .....	4-2
4.4 Discussion of Regulatory and Safety Issues.....	4-3
5.0 References.....	5-1
6.0 Disclaimer.....	6-1
7.0 Qualification.....	7-1
8.0 Signatures of Professionals.....	8-1

---

## *List of Tables*

---

1. Details of Temporary Soil Vapor Probes
2. Field Analytical Results
3. Laboratory Analytical Results

## *List of Figures*

---

1. Site Location
2. Site Plan and Location of Soil Vapor Probes
3. Methane Concentrations Measured with Field Meter
4. Laboratory Analytical Results
5. Methane vs CO<sub>2</sub> and O<sub>2</sub> Field Analytical Results

## *List of Appendices*

---

- |            |   |
|------------|---|
| Appendix A | Work Plan for Soil Vapor Assessment               |
| Appendix B | Laboratory Analytical Report and Chain-of-Custody |
-

## List of Acronyms and Abbreviations

%	percent by volume
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
1,1,1-TCA	1,1,1-trichloroethane
C <sub>2</sub> H <sub>6</sub>	ethane
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
COC forms	chain-of-custody forms
ESD	Environmental Services Department
FADLs	Field Activity Daily Logs
FID	flame ionization detector
FID/TCA	flame ionization detector/total combustion analysis
FDGTI	Fluor Daniel GTI, Inc.
GC	gas chromatography
GC/MS	gas chromatography/mass spectrometry
H <sub>2</sub> S	hydrogen sulfide
IDLH	immediately dangerous to life or health
IT	IT Corporation
Landfill	Mission Bay Landfill
LEA	Local Enforcement Agency, City of San Diego Solid Waste
LFG	landfill gas
M&RP	Monitoring and Reporting Program
MEK	2-butanone
N <sub>2</sub>	nitrogen
O <sub>2</sub>	oxygen
PCBs	polychlorinated biphenyls
ppb	parts per billion
ppmv	parts per million by volume
RWQCB	Regional Water Quality Control Board
SeaWorld	SeaWorld San Diego
SVOCs	semivolatile organic compound
TCD/GC	thermal conductivity detection/gas chromatography
TGNMO	total gaseous non-methane organics
TOCs	total organic compounds
VOCs	volatile organic compounds
WDRs	Waste Discharge Requirements

## 1.0 Introduction and Summary of Conclusions

---

On behalf of SeaWorld San Diego (SeaWorld), IT Corporation (IT) prepared this report to document soil vapor data collected from the 16-acre tract of the proposed SeaWorld development. The proposed development is near the City of San Diego's closed Mission Bay Landfill (Landfill). While the proposed development will not encroach upon the waste-fill area of the Landfill, this work was commissioned to assess the migration of landfill gas (LFG) from the Landfill to the development area, and to determine the nature and extent of detectable soil gas parameters of concern.

This work was conducted in general accordance with the work plan approved by the City of San Diego Solid Waste Local Enforcement Agency (LEA) (Appendix A). On October 22 and 23, 2001, IT directed the installation of temporary soil vapor probes at 28 locations. On October 23 and 24, 2001, IT staff collected soil vapor samples from these probes. Using portable field meters, the soil vapor samples were analyzed for methane, carbon dioxide, oxygen and total organic compounds (TOCs). Based on these field analytical results, additional soil vapor samples were collected from five probe locations that had detectable methane, and submitted to laboratories for more detailed analyses. 24 hr.

Elevated methane concentrations were observed at some of the sampling locations. No field methane concentrations greater than 0.5 percent by volume (%) were found at distances greater than 400 feet from the Landfill, and all methane concentrations greater than 5 % were observed within 300 feet of the approximate edge of the Landfill. No individual volatile organic chemicals (VOCs), such as petroleum VOCs or the halogenated VOCs present in degreasers, solvents and oil aerosol propellants, were detected in any of the laboratory samples. This suggests that the source of the methane is the decomposition of buried green waste or fill soil containing a relatively high organic content, rather than typical municipal solid waste.

The methane detected in the soil vapor immediately adjacent to the Landfill is routinely found, monitored and mitigated in developments in southern California near landfills, and can be properly addressed in future development at SeaWorld using common engineering practices.

## 2.0 Background

---

The SeaWorld Master Plan (ProjectDesign Consultants, 2001) proposes to build facilities on a portion of 16 acres of land located east of the existing SeaWorld Adventure Park and north of the Mission Bay Landfill, as illustrated in Figures 1 and 2. The wastes contained in the landfill may generate LFG which is composed of methane, carbon dioxide, and toxic and/or hazardous air contaminants that may be released through a permeable soil surface. Landfill gas, if present in the vicinity of the proposed expansion, could potentially present a hazard to the constructors and to the development.

The tract proposed for development was formed by placement of fill that was dredged from Mission Bay. The fill may contain natural organic matter. The decay of organic material in the fill may generate a naturally-occurring soil gas having similarities to landfill gas.

The Mission Bay Landfill was closed in 1959, and was covered (capped) with over five feet of soil between 1959 and 1962. The landfill is currently maintained in accordance with two documents.

- *Post Closure Land Use Plan for Mission Bay South Shores Phase III* (RDI&A, et al., 1995). The post closure land use plan was prepared by the City's consultant and is functionally the City's Report of Waste Discharge and Post Closure Maintenance Plan for the landfill.
- *Order 97-11, General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills Within the San Diego Region* (RWQCB, 1997). The landfill owner, the City of San Diego, is required to comply with the Waste Discharge Requirements (WDRs) and Monitoring and Reporting Program (M&RP) presented in Order 97-11.

The City Environmental Services Department (ESD) performs groundwater and surface water detection monitoring at the frequency required by Order 97-11. The City has two groundwater monitoring wells on the perimeter of the landfill in the vicinity of the proposed SeaWorld expansion. The data collected by the City has not indicated a landfill release to groundwater in the vicinity of the proposed expansion area (EMCON/OWT, 2001).

In 1997, SeaWorld contracted Fluor Daniel GTI, Inc. (FDGTI) to perform a Phase II Environmental Assessment of the land east of the existing adventure park and north of the landfill (FDGTI, 1997). FDGTI drilled and constructed six groundwater monitoring wells, and

sampled and analyzed groundwater from the wells. The results indicated low concentrations of acetone and 2-butanone (MEK) were present in soil, and trace concentrations of 1,1,1-trichloroethane (1,1,1-TCA) were present in groundwater. Acetone had a maximum soil concentration of 220 micrograms per kilogram ( $\mu\text{g/kg}$ ) (220 parts per billion by weight [ppb]). MEK was detected once in soil at a concentration of 36 ppb. 1,1,1-TCA had a maximum concentration of 7.2 micrograms per liter ( $\mu\text{g/L}$ ) (7.2 ppb) in groundwater. FDGTI also detected hydrogen sulfide gas (9 parts per million by volume [ppmv]) and methane (1,000 ppmv) in one soil boring at a depth of 35 feet.

The Regional Water Quality Control Board (RWQCB) requested in 2001 that the City ESD and SeaWorld jointly gauge and sample their respective wells to provide an up-to-date "snapshot" of groundwater elevations and groundwater concentrations. The joint monitoring event occurred in the week of July 9, 2001 (EMCON/OWT, 2001).

Wells within the proposed expansion area (LE-1, LE-4, LE-6, MBW-2, and MBW-3) were analyzed for VOCs, semivolatile organic compound (SVOCs), pesticides, herbicides, and polychlorinated biphenyls (PCBs), one VOC was detected. Diethyl ether was present in wells MBW-2 and MBW-3 at trace concentrations of 1.7 and 3.6 ppb ( $\mu\text{g/L}$ ). One SVOC compound, bis(2-ethylhexyl)phthalate, was detected in Wells LE-1 and MBW-2 at concentrations of 11.2 and 3.6 ppb (EMCON/OWT, 2001).

The following table summarizes the groundwater and soil results reported by FDGTI (1997) and EMCON/OWT (2001).



### Summary of Previously Collected Soil and Groundwater Data

Chemical Name (CAS Number)	Media Detected (Date)	Maximum Detected Concentration	Regulatory Limits	Notes
Acetone (67-64-1)	Soil (1997)	220 µg/kg	PRG 6,200 mg/kg	Chemical is a common laboratory contaminant, and the detection may be a false positive.
2-butanone (78-93-3)	Soil (1997)	36 µg/kg	PRG 28,000 mg/kg	Chemical is a common laboratory contaminant, and the detection may be a false positive.
1,1,1-trichloroethane (71-55-6)	Groundwater (1997) [not detected in 2001]	7.2 µg/L	MCL 200 µg/L PRG 540 µg/L	
Diethyl ether (60-29-7)	Groundwater (2001)	3.6 µg/L	PRG 1,200 µg/L	Chemical is a common laboratory contaminant, and the detection may be a false positive.
Bis(2-ethylhexyl)phthalate (117-81-7)	Groundwater (2001)	11.2 µg/L	MCL 4 µg/L PRG 4.8 µg/L	Chemical is a common laboratory contaminant, and the detection may be a false positive.

#### Explanation:

CAS = Chemical Abstracts Service registry number.

MCL = primary Maximum Contaminant Level for drinking water (California Dept. of Health Services).

PRG = Preliminary Remediation Goal (for industrial soil or tap water) published in the lookup table of screening values published in the U.S. EPA Region IX "PRG2000 Table."

µg/kg = micrograms per kilogram (parts per billion [ppb]).

µg/L = micrograms per liter (parts per billion [ppb]).

mg/kg = milligrams per kilogram (parts per million [ppm]).

#### General note about regulatory limits:

The MCLs and PRGs are provided here for comparison purposes only. The MCLs and PRGs for groundwater are only applicable to drinking water, and are not applicable at the subject site because the local groundwater is not used for drinking water purposes and the aquifer is not designated for beneficial use by the RWQCB.

### 3.0 Collection and Analysis of Soil Vapor Samples

---

This section addresses probe construction methods and details, sample collection methods, and analytical techniques used for soil vapor samples.

#### 3.1 Soil Vapor Probe Construction

Soil vapor probes were constructed at the 28 locations illustrated in Figure 2. The locations were spaced at approximately 100-foot intervals. The temporary soil vapor probes were installed by HP Labs using a truck-mounted direct push/hammer Strataprobe drilling rig. The direct push drilling method advances a 2-inch-diameter drive point and produces no soil cuttings. The soil displaced by drilling is pushed laterally away from the boring.

The work plan proposed that soil vapor probes be installed at depths of 5- and 15-feet, at each location. Because of the shallow groundwater encountered at some locations, the proposed 15-foot probe was not completed at those locations. Instead, the deep probe was installed at 10 or 12 feet below ground surface or no deep probe was installed. No borings were advanced beyond the water table, which is between 10- and 20-feet below grade (EMCON/OWT, 2001).

Table 1 lists the construction details for each soil vapor probe.

A typical deep probe included a steel penetration cone with gas inlet perforations. The cone attached to 1/8-inch diameter nylon tube that connected the penetration cone to the sampling port located above the ground surface. Silica sand was added to the annular space surrounding the gas inlet perforation to create a sand pack around the probe.

After completing the deep probe sand pack, bentonite was added to the annular space of the boring, and hydrated in two-foot lifts. When the annular space had been filled up to five feet below grade, a 1-inch long screen (connected to nylon tubing) was lowered down the boring into the annular space to act as the shallow vapor probe. This screen was then surrounded by sand. The remainder of the annular space was filled with bentonite, hydrated in two-foot lifts.

The surface expression of a typical vapor probe installation consisted of two 1/8-inch-diameter nylon tubes exiting the ground surface, and sealed with a Tygon ball valve. The ball valves allowed the tube to be sealed from atmospheric influence when the vapor probes were not in use, and allowed subsequent sampling at convenient times.

## 4.0 Analytical Results

---

This section describes the analytical results and provides an interpretation of the data.

### 4.1 Field Analytical Results

Table 2 provides tabulated results for the field analyses. The field methane measurements are illustrated in Figure 3.

Methane gas was not detected at 14 of the 28 probe locations; that is, the concentration of methane was below the detection limit of approximately 0.1 %. Six of the probe locations had methane concentrations greater than 1 %, and four probe locations had methane concentrations greater than 5 %. The highest methane concentration, 10.2 %, was detected at soil vapor probe J-28s. Total organic compound concentrations ranged from undetectable (<0.1 ppmv) to greater than 50,000 ppmv (the FID had a maximum detectable concentration of 50,000 ppmv). The highest TOC concentrations were detected at probes J-21s, J-24d, and J-28s. A qualitative comparison of the TOC and methane results indicates that the TOC and methane concentrations are approximately directly proportional.

Carbon dioxide concentrations ranged from non-detect (<0.1 %) to 19.5 %, and oxygen concentrations ranged from 7.2 % to 20.5 %. A qualitative comparison of the concentrations of methane, oxygen and carbon dioxide concentrations collected from the 28 probe locations indicates that, in general:

- Increasing methane concentrations corresponded to decreasing oxygen concentrations
- Increasing methane concentrations corresponded with increasing carbon dioxide concentrations.

### 4.2 Laboratory Analytical Results

Table 3 provides tabulated results for the five soil vapor samples analyzed at fixed base laboratories. The laboratory results are also depicted on the site plan in Figure 4. The laboratory analytical reports are provided in Appendix B.

Several observations are noted in the laboratory data.

- The laboratory methane results ranged from 0.43 % to 21.6 %, and were consistent with the field analytical results
- Ethane concentrations ranged from non-detect (<0.1 ppmv) to 14.4 ppmv
- The concentration of TGNMO ranged from 4.02 to 78.0 ppmv
- The concentration of hydrogen sulfide ranged from nondetect (<0.3 ppmv) to 1,820 ppmv
- No individual VOCs (e.g., halogenated VOCs and petroleum VOCs) were detected in the VOC individual analysis

#### 4.3 Discussion of Analytical Results

Methane in shallow soil typically results from anaerobic decomposition of buried organic matter. The methane vapor that is generated by organic decay typically migrates away from the source toward areas of lower concentration via advection and diffusion. The distribution of methane field analytical results in Figure 3 illustrates that the highest methane concentrations (up to a maximum of 10.2 %), and all methane concentrations greater than 5 %, were observed within 300 feet of the approximate edge of the Mission Bay Landfill. At distances of greater than 400 feet from the landfill, the field methane concentrations were all below 0.5 %. The geographic distribution of methane data indicates that the source of methane is in the vicinity of the Mission Bay Landfill.

The field analytical results for a number of soil vapor probes (Figure 5) illustrate that elevated methane concentrations are coincident with decreased oxygen concentrations and increased carbon dioxide concentrations (e.g., probe J-28s, Table 2). These data relationships are consistent with anaerobic degradation being the source of methane.

Several probes have field analytical data that indicate aerobic degradation of organic matter. For instance, the presence of elevated TOC concentrations accompanied by near atmospheric concentrations of oxygen indicates that aerobic decomposition of organic material is occurring. Another indicator of aerobic decomposition is the presence of carbon dioxide with an absence of methane. This occurs because carbon dioxide is the respiratory by-product of aerobic microbial activity. Both of these indicators suggest that the fill contains a relatively high organic content that, in places, is degrading aerobically.

The low ethane concentrations (relative to methane) indicate that the methane source is decay of organic matter, and not petroleum natural gas.

Municipal solid waste landfill gas often contains trace concentrations of volatile organic compounds such as halogenated VOCs (e.g., the halogenated VOCs present in degreasers, solvents and old aerosol propellants) and petroleum VOCs (e.g., benzene, toluene, xylenes, ethylbenzene). No individual VOCs were detected in the soil vapor samples analyzed by GC/MS method. This suggests that the source of methane may not be typical landfill gas, such as municipal solid waste. Rather, the source of methane may be buried green waste or fill soil containing a relatively high organic content.

Volatile organic compounds were essentially not detectable in both groundwater and soil gas (the VOC detections in groundwater were only traces, or were possibly laboratory cross contamination). At other landfills, investigators have observed that the detection of VOCs in soil vapor is associated with corresponding detections of VOCs in groundwater, generally due to diffusion transport of VOCs from vapor into groundwater. In this investigation of Mission Bay Landfill, the VOC soil gas and groundwater results were both nondetect, which is consistent.

A portion of the organic matter may be in the form of sulfur compounds, which under anaerobic and sometimes under certain aerobic conditions, are converted to hydrogen sulfide. Typically, in most landfills, the hydrogen sulfide concentration is between 5 and 200 ppmv. The difference in the range is usually attributed to how much sludge the landfill received from sewage treatment plants or in a few cases the amount of construction material (drywall) accepted to the landfill. Sulfur reducing bacteria are present everywhere and these types of substrate lead to hydrogen sulfide production.

The unusually high concentration of hydrogen sulfide at one probe (1,820 ppmv in probe J-24d) is likely either an anomaly or the result of a deposit of sulfur materials in close proximity to the probe. Hydrogen sulfide is dangerous at a concentration of 10 ppmv and has an IDLH (Immediately Dangerous to Life or Health) concentration of 100 ppmv. While the concentration of the hydrogen sulfide in probe J-24d was above health safety limits, the concentration in the air above a landfill site is typically 2 to 3 orders of magnitude less, as the soil vapor dissipates into the atmosphere. However, caution and monitoring should still be applied at this location.

#### **4.4 Discussion of Regulatory and Safety Issues**

Our interpretation of the analytical data leads us to conclude that the Mission Bay Landfill is the source of relatively elevated concentrations of methane detected in soil vapor adjacent to the Mission Bay Landfill. This methane can be monitored and mitigated in future site development. In fact, methane is routinely monitored and mitigated at developments in southern California,

particularly in the Los Angeles Basin and Newport Beach areas where methane is encountered more frequently and methane mitigation measures are addressed in local building codes (methane in these areas is typically due to naturally occurring petroleum).

Landfill gas in this San Diego location is subject to the regulations in Title 27 -- the combined regulations relevant to landfills, enforced by the California Integrated Waste Management Board and the State Water Resources Control Board -- and may be subject to additional regulations, including local building codes. IT believes that several safety practices and requirements of Title 27 apply to this site, based on the data collected in this study.

- The landfill owner should implement a landfill gas investigation, and possibly a gas monitoring program, that is in accordance with Title 27.
- The landfill owner must ensure "that the concentration of methane does not exceed the lower explosive limit for methane at the facility property boundary" (Title 27). The LEL for methane is 5 %.
- Enclosed structures such as enclosed buildings, basements, vaults and sumps, that are constructed within 1,000 feet of a landfill boundary may require periodic methane monitoring or continuous methane monitoring (e.g., a methane detector and alarm).
- If structures are built near the landfill, in the future, then the design may need to incorporate gas mitigation measures, such as active gas control measures (e.g., gas extraction wells) or passive gas control measures (e.g., cutoff trenches, slurry walls and vent trenches).
- If structures have the potential to accumulate methane gas in enclosed spaces, then gas control measures may need to be incorporated into the structure (e.g., flexible membrane liners beneath foundations and floors, passive or active vent systems, gas detectors with alarms, and ignition source control).
- If the landfill and surrounding land is paved with materials that are impermeable to landfill gas, then there is potential to increase the effective seal of the ground surface. This could result in increased concentrations of landfill gas accumulating within soil vapor.

The landfill gas documented in this investigation can be mitigated in future development using common engineering practices.

## 5.0 References

---

Department of Environmental Health, Site Assessment and Mitigation Division (County of San Diego), 2001. *Draft Guidelines for Laboratory Analysis of Soil Gas Samples*. May 1.

EMCON/OWT, 2001. *Groundwater Conditions in the Vicinity of Mission Bay Landfill*. September 27. Prepared for the City of San Diego Environmental Services Department.

Fluor Daniel GTI, Inc. (FDGTI), 1997. *Assessment Report, Sea World Lease Expansion*. June 9. Prepared for SeaWorld.

ProjectDesign Consultants, 2001. *Master Plan Update. Final Draft*. March 23.

RDI&A, RBF/Sholders and Sanford, Woodward-Clyde Consultants, Randall Lamb Associates, 1995. *Postclosure Land Use Plan for Mission Bay South Shores Phase III*. September, revised October. Prepared for the City of San Diego Park Development and Open Space Division.

---

Regional Water Quality Control Board (RWQCB), 1997. *Order 97-11, General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Landfills within the San Diego Region*.

---

## 6.0 Disclaimer

---

The statements, opinions and conclusions contained in this report are based solely upon the services performed by IT Corporation (IT) as described in this report and the Scope of Work as established for the report by Client's budgetary and time constraints and the terms and conditions of the agreement with Client. In performing these services and preparing the report, IT relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by IT Corporation.

In addition, Client has been advised and understands that the absence of contamination in one location does not necessarily preclude the finding of contamination in other locations that were not investigated in preparing this report.

This report is intended for Client's sole and exclusive use and not for the benefit of others and may not be used or relied upon by others. The findings of the report are limited to those specifically expressed in the report and no other representations or warranties are given by IT and no additional conclusions should be reached or representations relied on other than those expressly stated in the report and as limited by IT Terms and Conditions.



## 7.0 Qualification

---

IT delivers this report subject to the terms and conditions of the contract with Client. IT's conclusions are based solely on the services described in the report and not on any other service except to the extent the report specifically indicates that IT performed such service. IT has no obligation to provide services with respect to the Property or investigation of its past or present condition or uses other than those described in the report.

The scope of IT's investigation of the Property was limited by Client's budgetary and time constraints and IT has relied on the efforts of others, including public agencies, whose work IT cannot guarantee. In addition, there are certain inherent limitations on the nature, quality and reliability of the data presented, including the fact that the absence of contamination in one location does not preclude the finding of the same or other contaminants in other locations which were not investigated in preparing this report. IT's report is based on present regulatory criteria and interpretations; these criteria are constantly changing and a condition which does not now require any action may, in the future fall under different standards and require remediation.

No statement or opinion in this report shall be deemed to create any warranty or representation, express or implied, with respect to the Property, or that the Property is uncontaminated, or that the Property complies with environmental or other statutes, regulations, ordinances, or other laws. IT hereby disclaims any and all warranties with respect to the Property, including any and all warranties of merchantability and/or fitness for a particular purpose. Nothing herein shall be construed as any representation, warranty, or guarantee that Client or IT has performed all appropriate inquiry as defined in CERCLA Section 101 (35)(B) or any other or similar standard under any state or federal law.

Client acknowledges that IT has not advised Client, either orally or in writing, that additional investigation concerning the Property is unwarranted or inadvisable. Client understands that IT is not licensed to practice environmental (or other) law, and Client is advised to consult with an environmental lawyer of its choice concerning the adequacy of Client's inquiry concerning the Property and any potential liability with respect to the condition of the Property. IT delivers this report to Client on the express condition and understanding that (i) Client shall be solely responsible for determining whether the Property is usable for Client's intended purposes; (ii) that Client shall make any decision concerning the purchase, sale, or other use of the Property in

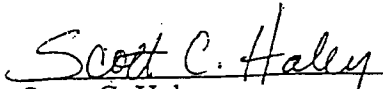
reliance on its own judgment and investigation of the Property and has not relied, and shall not rely, on any representation by IT.

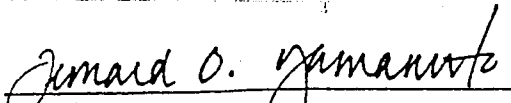
This report is intended to be considered in its entirety and no excerpt or portion thereof may be quoted or used out of its context or other than as a portion of the complete report. This report is intended for Client's sole and exclusive use. It may not be reproduced or communicated in any fashion to any person or used by any person other than Client without the express written permission of IT.


## 8.0 Signatures of Professionals

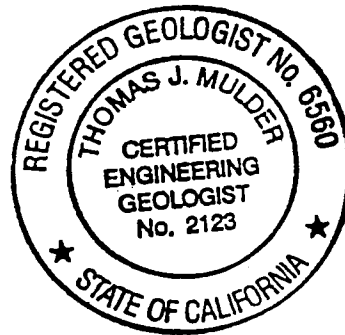
---

This report was prepared in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

  
\_\_\_\_\_  
Scott C. Haley  
Project Chemical Engineer  
IT Corporation

  
\_\_\_\_\_  
for Wayne Nakagawa, P.E.  
Senior Consultant, Chemical Engineer  
IT Corporation

  
\_\_\_\_\_  
Thomas J. Mulder, C.E.G.  
Project Manager  
IT Corporation



## TABLES

**TABLE 1**  
Details of Temporary Soil Vapor Probes  
SeaWorld San Diego

Probe ID	Approximate Elevation of Ground Surface (feet)	Depth of "Shallow" Probe (feet)	Depth of "Deep" Probe (feet)
J-1	21	5	10
J-2	10	5	NC
J-3	18	5	10
J-4	18	5	10
J-5	17	5	10
J-6	13	5	NC
J-7	11	5	NC
J-8	18	5	10
J-9	13	5	NC
J-10	15	5	10
J-11	20	5	10
J-12	16	5	10
J-13	16	5	10
J-14	21	5	15
J-15	18	5	10
J-16	18	5	10
J-17	19	5	12
J-18	19	5	15
J-19	20	5	15
J-20	18	5	15
J-21	19	5	15
J-22	19	5	15
J-23	19	5	15
J-24	19	5	15
J-25	20	5	15
J-26	19	5	15
J-27	20	5	15
J-28	20	5	15

Notes:

- 1) Soil vapor probes were installed on October 22 and 23, 2001.
- 2) The annulus between the deep and shallow probes was filled with bentonite.
- 3) The annulus surrounding the soil gas screens was filled with silica sand.
- 4) NC = not constructed

**TABLE 2**  
Field Analytical Results  
SeaWorld San Diego

Probe ID	Depth	Date	Time	Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Balance Gas %	Total Organic Compounds (TOC) ppmv	Notes
J-1	Shallow	10/24/2001	1230	0.0	0.0	20.4	79.6	36	
J-1	Deep	10/24/2001	1235	0.0	1.3	18.8	79.9	59	Slight sulfur odor
J-2	Shallow	10/24/2001	1240	0.1	3.5	18.0	78.4	2,564	Sulfur odor
J-2	Shallow	10/25/2001	645	0.0	2.8	18.8	78.4	2,600	
J-3	Shallow	10/24/2001	1355	0.0	1.0	18.4	80.6	41	
J-3	Deep	10/24/2001	1400	0.0	0.9	18.9	80.2	68	
J-4	Shallow	10/24/2001	1220	0.0	0.9	19.0	80.1	30	
J-4	Deep	10/24/2001	1225	0.0	0.8	19.2	80.0	29	
J-5	Shallow	10/24/2001	1210	0.0	0.6	19.7	79.7	32	
J-5	Deep	10/24/2001	1215	0.0	0.4	19.7	79.9	34	
J-6	Shallow	10/24/2001	1200	0.0	0.0	20.4	79.6	34	
J-7	Shallow	10/24/2001	1150	0.0	0.9	19.0	80.1	41	
J-8	Shallow	10/24/2001	1245	0.0	0.3	19.7	80.0	413	
J-8	Deep	10/24/2001	1250	0.0	1.0	18.7	80.3	1,110	
J-9	Shallow	10/24/2001	1130	0.0	3.5	16.5	80.0	46	
J-10	Shallow	10/24/2001	1135	0.0	0.4	19.8	79.8	43	
J-10	Deep	10/24/2001	1140	0.0	0.3	19.9	79.8	41	
J-11	Shallow	10/23/2001	1720	0.1	1.9	17.1	80.9	NA	
J-11	Shallow	10/24/2001	1255	0.0	1.4	19.0	79.6	41	
J-11	Deep	10/23/2001	1730	0.2	2.9	15.8	81.1	NA	
J-11	Deep	10/24/2001	1300	0.1	1.1	18.8	80.0	2,859	
J-12	Shallow	10/24/2001	1115	0.0	0.0	20.2	79.8	49	
J-12	Deep	10/24/2001	1120	0.0	0.9	18.9	80.2	55	
J-13	Shallow	10/24/2001	1105	0.0	0.8	19.2	80.0	275	
J-13	Deep	10/24/2001	1110	0.0	3.7	15.3	81.0	1,000	
J-14	Shallow	10/23/2001	1700	0.0	NA	NA	NA	NA	
J-14	Shallow	10/24/2001	1305	0.0	1.9	19.0	79.1	900	
J-14	Shallow	10/25/2001	730	0.0	3.8	18.1	78.1	1,600	Sulfur odor
J-14	Deep	10/23/2001	1710	6.1	5.7	12.6	75.6	NA	
J-14	Deep	10/24/2001	1310	0.7	0.8	19.3	79.2	13,900	
J-14	Deep	10/25/2001	730	1.6	1.9	18.3	78.2	35,000	Sulfur odor
J-15	Shallow	10/24/2001	1040	0.0	0.2	19.8	80.0	71	
J-15	Deep	10/24/2001	NA	0.3	1.1	18.9	79.7	4,380	

TABLE 2  
Field Analytical Results  
SeaWorld San Diego

Probe ID	Depth	Date	Time	Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Balance Gas %	Total Organic Compounds (TOC) ppmv	Notes
J-16	Shallow	10/24/2001	1055	0.1	0.2	20.0	79.7	2,420	
J-16	Deep	10/24/2001	1100	0.5	0.7	19.3	79.5	7,050	
J-17	Shallow	10/23/2001	1640	0.0	2.9	17.8	79.3	NA	
J-17	Shallow	10/24/2001	1345	0.0	0.6	19.8	79.6	37	
J-17	Deep	10/23/2001	1650	0.5	0.2	20.1	79.2	NA	
J-17	Deep	10/24/2001	1350	0.1	0.0	20.4	79.5	1,844	Strong sulfur odor
J-18	Shallow	10/23/2001	1600	0.1	8.9	15.8	75.2	NA	
J-18	Shallow	10/24/2001	1335	0.0	3.4	18.6	78.0	890	
J-18	Deep	10/23/2001	1620	0.0	0.0	20.3	79.7	NA	
J-18	Deep	10/24/2001	1340	0.0	0.0	20.4	79.6	34	
J-19	Shallow	10/23/2001	1530	0.0	0.0	20.4	79.6	NA	
J-19	Shallow	10/24/2001	1315	0.2	2.4	18.6	78.8	4,200	
J-19	Deep	10/23/2001	1545	NA	NA	NA	NA	NA	No vapor flow
J-19	Deep	10/24/2001	1320	0.0	0.0	20.5	79.5	38	
J-20	Shallow	10/24/2001	1000	0.2	0.2	20.2	79.4	2,778	
J-20	Deep	10/24/2001	1005	0.0	0.0	20.4	79.6	32	Very low vapor flow rate
J-21	Shallow	10/24/2001	945	6.2	5.5	16.2	72.1	>50,000	FID flame out
J-21	Shallow	10/25/2001	655	6.1	4.7	17.4	71.8	47,000	FID flame out
J-21	Deep	10/24/2001	950	0.0	0.0	20.5	79.5	32	
J-22	Shallow	10/23/2001	1345	0.0	5.1	17.2	77.7	NA	
J-22	Shallow	10/24/2001	1405	0.0	1.6	19.2	79.2	86	
J-22	Deep	10/23/2001	1345	NA	NA	NA	NA	NA	Water in probe line
J-22	Deep	10/24/2001	1410	NA	NA	NA	NA	NA	No vapor flow, water in vapor line
J-23	Shallow	10/23/2001	1400	1.6	8.9	15.3	74.2	NA	
J-23	Shallow	10/24/2001	1415	0.5	1.4	19.3	78.8	6,600	
J-23	Deep	10/23/2001	1400	NA	NA	NA	NA	NA	Water in probe line
J-23	Deep	10/24/2001	1420	0.0	0.0	20.4	79.6	30	
J-24	Shallow	10/23/2001	1420	0.0	5.5	16.0	78.5	NA	
J-24	Shallow	10/24/2001	1425	0.6	2.2	18.7	78.5	10,700	Sulfur odor
J-24	Shallow	10/25/2001	720	8.4	8.8	16.2	66.6	>50,000	Sulfur odor
J-24	Deep	10/23/2001	1440	1.8	1.2	18.9	78.1	NA	Strong sulfur odor
J-24	Deep	10/24/2001	1430	3.6	2.7	19.0	74.7	>50,000	Strong sulfur odor
J-24	Deep	10/25/2001	725	9.4	7.5	17.4	65.7	>50,000	FID Flame out; Strong sulfur odor

**TABLE 2**  
Field Analytical Results  
SeaWorld San Diego

Probe ID	Depth	Date	Time	Methane (CH <sub>4</sub> ) %	Carbon Dioxide (CO <sub>2</sub> ) %	Oxygen (O <sub>2</sub> ) %	Balance Gas %	Total Organic Compounds (TOC) ppmv	Notes
J-25	Shallow	10/23/2001	1500	0.0	2.5	17.9	79.6	NA	
J-25	Shallow	10/24/2001	1435	0.0	1.3	19.0	79.7	25	
J-25	Deep	10/23/2001	1515	0.0	0.0	20.4	79.6	NA	
J-25	Deep	10/24/2001	1440	0.0	0.0	20.4	79.6	23	
J-26	Shallow	10/24/2001	900	2.1	2.3	19.4	76.2	34,000	
J-26	Deep	10/24/2001	915	0.0	0.0	20.4	79.6	2	
J-27	Shallow	10/24/2001	920	0.0	0.3	20.1	79.6	716	
J-27	Deep	10/24/2001	925	0.0	0.0	20.5	79.5	13	Water in probe line, strong sulfur odor
J-28	Shallow	10/23/2001	1335	10.2	19.5	7.2	63.1	1,775	
J-28	Shallow	10/24/2001	1445	6.0	7.6	15.5	70.9	>50,000	FID flame out
J-28	Shallow	10/25/2001	710	4.0	6.4	16.6	73.0	>50,000	FID flame out
J-28	Deep	10/23/2001	1340	0.0	0.0	20.5	79.5	2	
J-28	Deep	10/24/2001	1450	NA	NA	NA	NA	NA	Water in vapor line

**NOTES**

- 1) % = percent by volume
- 2) ppmv = parts per million by volume
- 3) Measurements were conducted after purging three liters from each vapor probe.
- 4) Methane, carbon dioxide, and oxygen levels were measured using a CES Landtec GEM 500. Methane levels were detected by infrared absorption while carbon dioxide and oxygen were detected by galvanic cell.
- 5) Total organic compound (TOC) values were measured using a flame ionization detector (FID) calibrated to methane.
- 6) NA = not analyzed.



**TABLE 3**  
Fixed Laboratory Analytical Results  
SeaWorld San Diego

Probe ID	Depth of Probe	Methane (CH <sub>4</sub> ) (%)	Carbon Dioxide (CO <sub>2</sub> ) (%)	Oxygen (O <sub>2</sub> ) (%)	Nitrogen (N <sub>2</sub> ) (ppmv)	Hydrogen Sulfide (H <sub>2</sub> S) (ppmv)	Ethane (C <sub>2</sub> H <sub>6</sub> ) (ppmv)	Total Gaseous Non-methane Organics (ppmv)	Individual Volatile Organic Compounds (ppmv)
J-2	Shallow	0.43	7.51	16.2	75.5	ND (<0.3)	ND (<1.0)	4.02	ND (<1.0)
J-14	Deep	3.17	2.95	17.8	76.4	0.47	4.97	27.3	ND (<1.0)
J-21	Shallow	21.6	15.6	9.6	53.5	9.41	14.4	60.7	ND (<1.0)
J-24	Deep	13.1	10.9	16.0	60.2	1,820	7.55	78.0	ND (<1.0)
J-28	Shallow	8.97	14.9	11.3	65.2	ND (<0.3)	3.46	132	ND (<1.0)

Notes:

- 1) % = percent by volume
- 2) ppmv = parts per million by volume
- 3) Vapor samples were collected after purging three liters from each vapor probe.
- 4) The samples were collected on October 25, 2001.
- 5) Methane, carbon dioxide, and oxygen were measured by thermal conductivity detection/gas chromatography (TCD/GC).
- 6) Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in an oxidative sulfur mode
- 7) "Individual Volatile Organic Compounds" comprises 24 compounds measured by EPA Method 8260B. No compounds were detected in any of the five samples.
- 8) Total Gaseous Non-methane Organics (TGNMO) was measured by flame ionization detection/total combustion analysis (FID/TCA), EPA Method 25.
- 9) ND (<0.3) = analyte at or below reported detection limit

## FIGURES

---

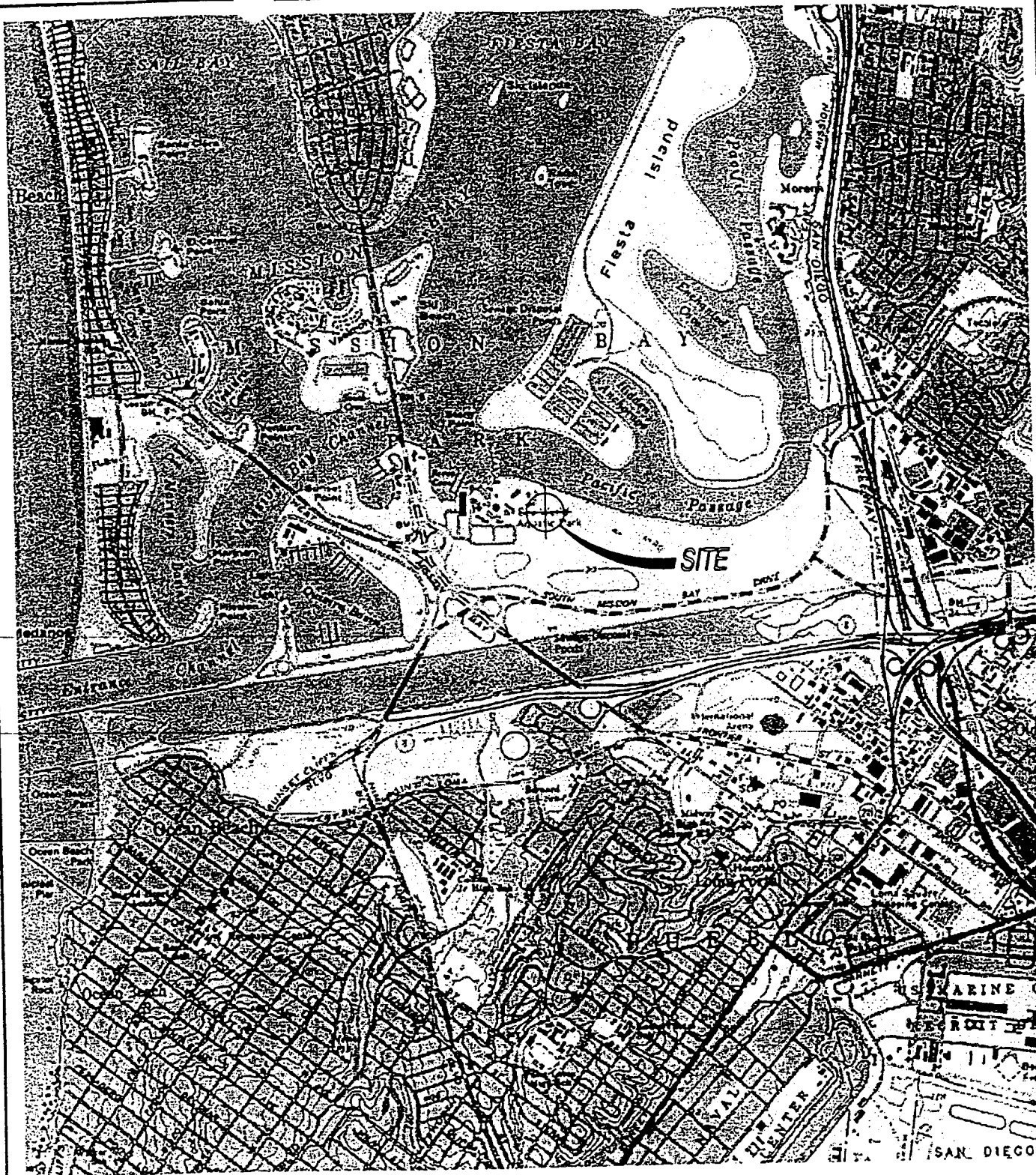
DRAWING NUMBER 828286-B6

APPROVED BY

CHECKED BY

DRAWN BY

SCH 10/31/01



SEAWORLD  
500 SEAWORLD DRIVE  
SAN DIEGO, CALIFORNIA

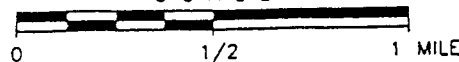
FIGURE 1

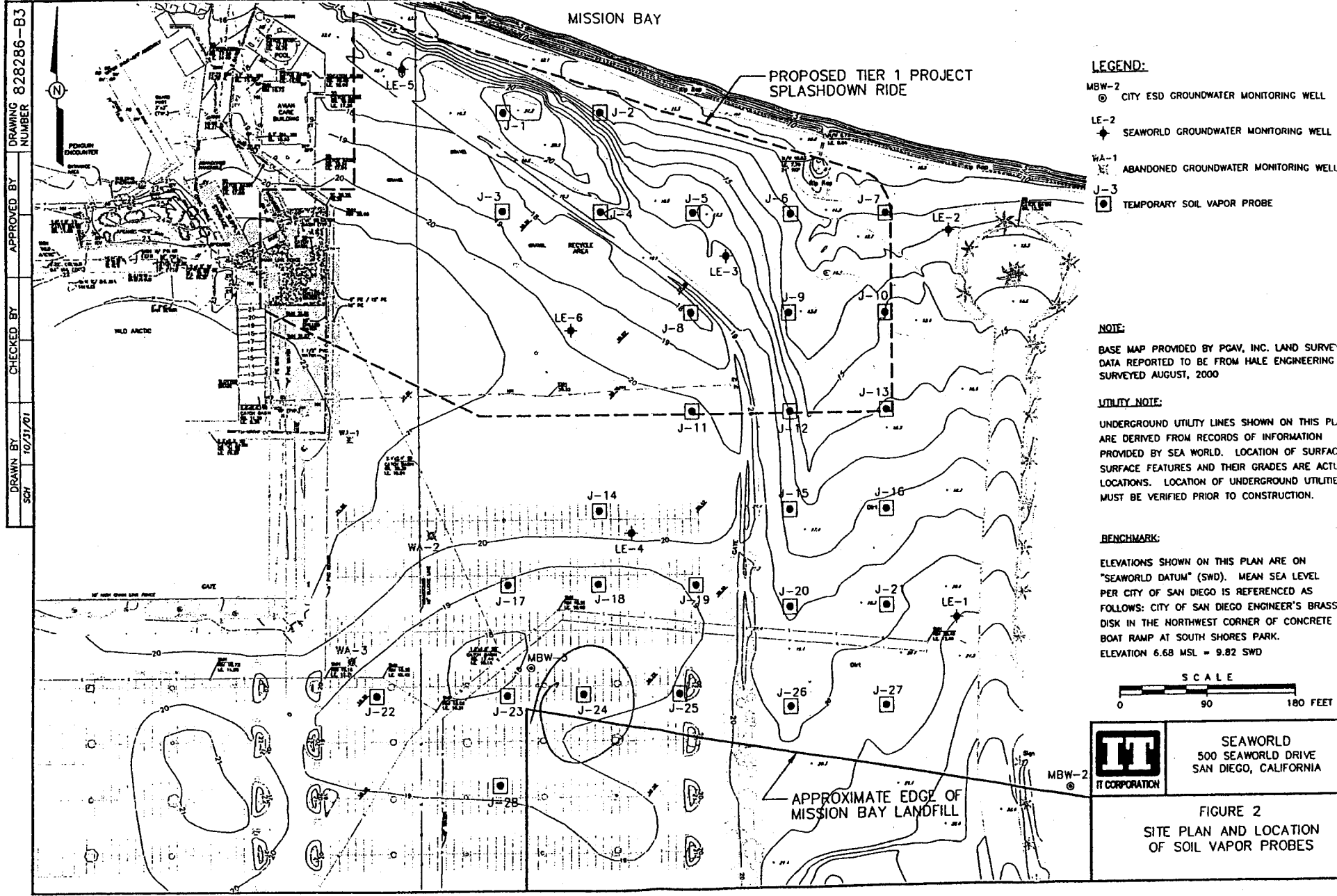
SITE MAP

SOURCE

PRINTED FROM TOPO!  
2001 NATIONAL GEOGRAPHIC  
HOLDINGS, INC.

SCALE



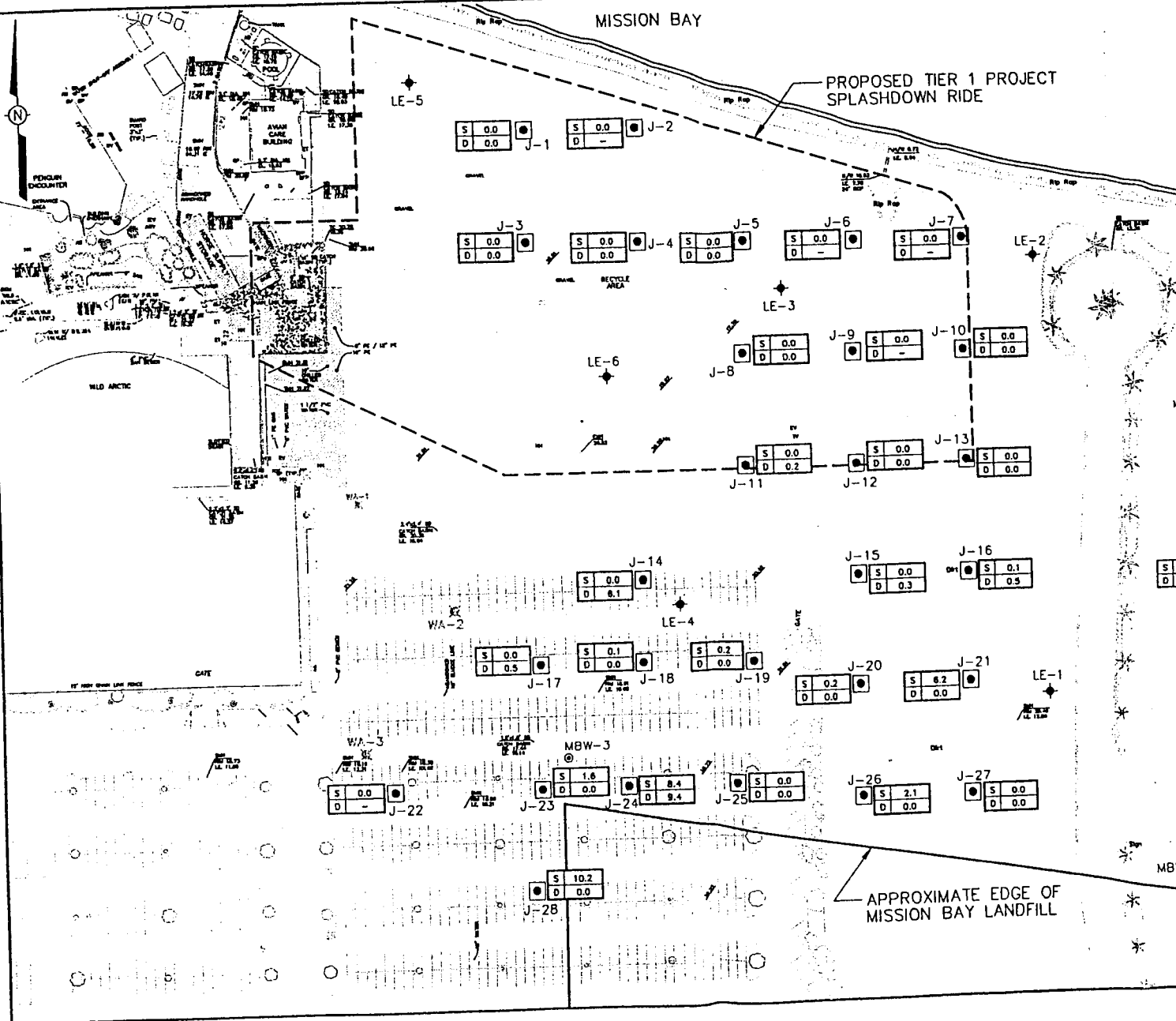


DRAWING NUMBER 828286-B8

APPROVED BY

CHECKED BY

DRAWN BY 10/31/01

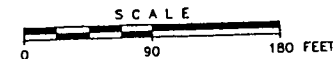


# LEGEND:

- MBW-2 CITY ESD GROUNDWATER MONITORING WELL
- LE-2 SEAWORLD GROUNDWATER MONITORING WELL
- WA-1 ABANDONED GROUNDWATER MONITORING WELL
- J-3 TEMPORARY SOIL VAPOR PROBE
- PERCENTAGE OF METHANE BY VOLUME AS MEASURED IN THE FIELD ON SEPTEMBER 23 & 24, 2001.. USING A LANDTEC GEM 500 (ONLY THE HIGHEST PERCENTAGE ARE SHOWN)
- S = SHALLOW
- D = DEEP

## NOTE:

BASE MAP PROVIDED BY PGAV, INC. LAND SURVEY DATA REPORTED TO BE FROM HALE ENGINEERING SURVEYED AUGUST, 2000



SEAWORLD  
500 SEAWORLD DRIVE  
SAN DIEGO, CALIFORNIA

FIGURE 3  
METHANE CONCENTRATIONS  
MEASURED WITH FIELD METER

DRAWING 828286-B7  
 DRAWN BY SCH 10/31/01  
 CHECKED BY  
 APPROVED BY

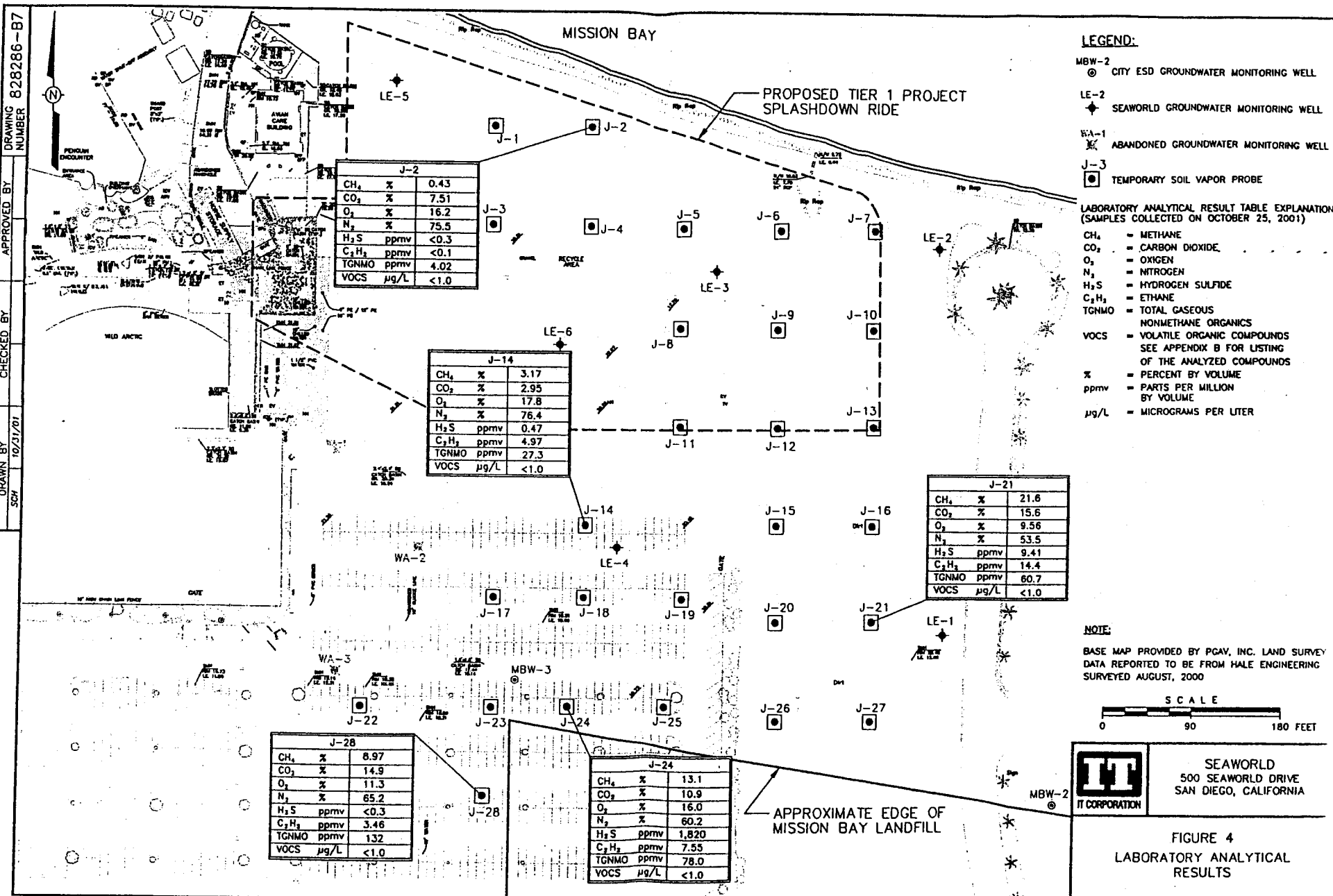
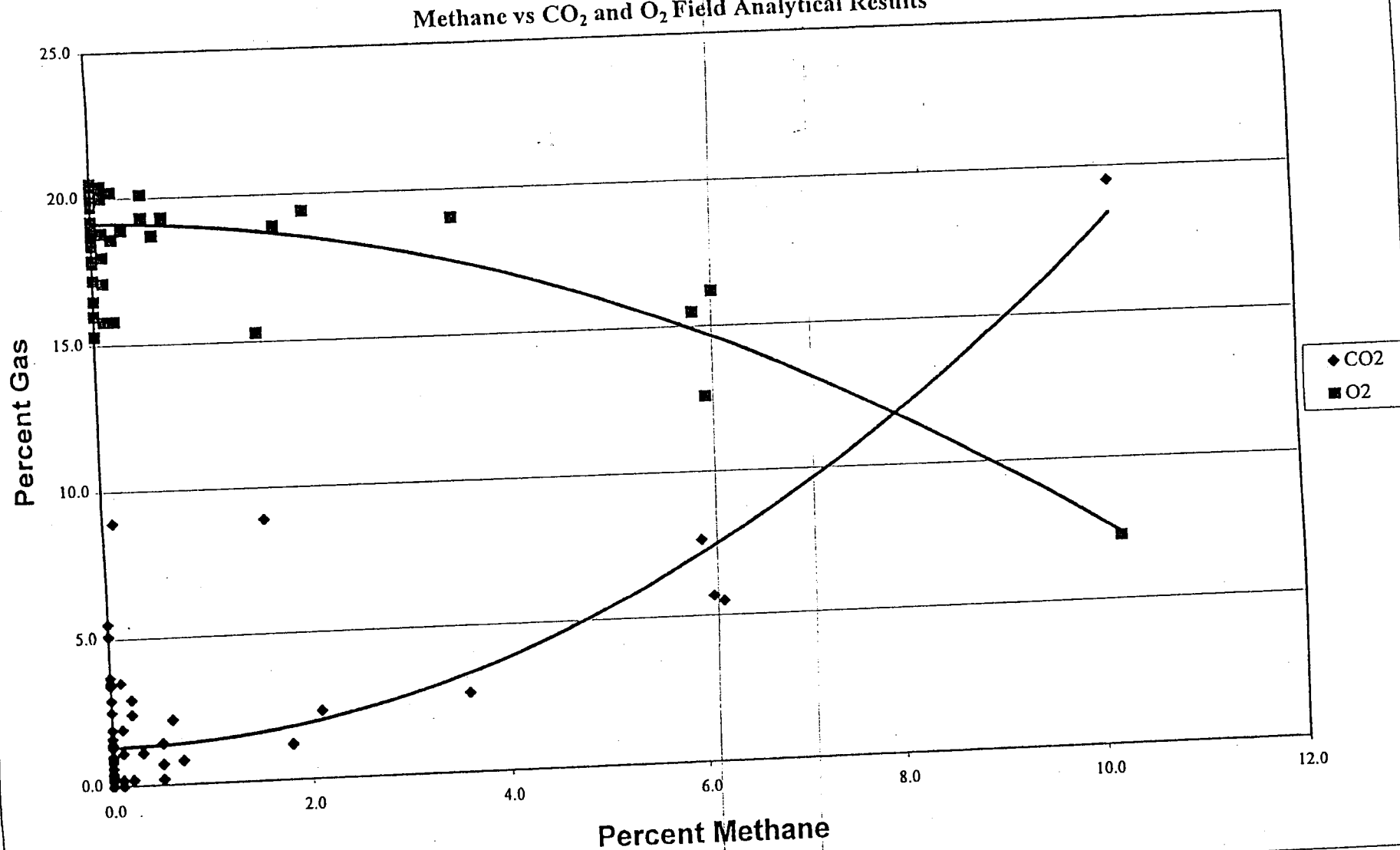


FIGURE 5  
Methane vs CO<sub>2</sub> and O<sub>2</sub> Field Analytical Results



## APPENDIX A

### WORK PLAN FOR SOIL VAPOR ASSESSMENT

---

---





**IT Corporation**

1230 Columbia Street, Suite 1200  
San Diego, CA 92101-8517  
Tel. 619.239.1690  
Fax. 619.239.1238

A Member of The IT Group

July 20, 2001

IT Corporation Project 828286

Ms. Rebecca Lafreniere, REHS  
Environmental Health Specialist  
Solid Waste Local Enforcement Agency  
City of San Diego  
1222 First Avenue, MS 501  
San Diego, CA 92101-4155

Work Plan for Soil Vapor Assessment  
SeaWorld Expansion Plan, 16-Acre Tract

Dear Ms. Lafreniere:

On behalf of SeaWorld, IT Corporation (IT) prepared this work plan to collect soil vapor data from the 16-acre tract of the proposed SeaWorld expansion. While the proposed expansion will not be above the Mission Bay Landfill, and the landfill is not known to generate appreciable landfill gas (LFG), a concern has been expressed that landfill gas may be present in the proposed expansion area. The objectives of this work plan are to determine if landfill gas is present in the expansion area, and to determine the nature and extent of detectable soil gas parameters of concern.

On behalf of SeaWorld, IT requests that Solid Waste Local Enforcement Agency (LEA) review and comment on this work plan by August 3, 2001, prior to the beginning of field work which is scheduled to start in August of 2001. IT has also sent copies of this work plan to the San Diego Regional Water Quality Control Board (RWQCB) and City of San Diego Environmental Services Department (City ESD) to solicit their review and comment prior to field work.

**Background**

The SeaWorld Master Plan (ProjectDesign Consultants, 2001) proposes to build facilities on a portion of 16 acres of land located east of the existing SeaWorld adventure park and north of the Mission Bay Landfill, as illustrated in Figure 1. The wastes contained in the landfill may generate LFG which is composed of methane, carbon dioxide, and toxic and/or hazardous air

Ms. Rebecca Lafreniere

2

July 20, 2001

contaminants that may be released through a permeable soil surface. Landfill gas, if present in the vicinity of the proposed expansion, could potentially present a hazard to the constructors and the development.

The tract proposed for development was formed by placement of fill that was dredged from Mission Bay. The fill may contain organic matter. The decay of organic material in the fill may generate a soil gas having similarities to landfill gas.

The Mission Bay Landfill was closed in 1959, and was covered (capped) with over five feet of soil between 1959 and 1962. The landfill is currently maintained in accordance with two documents.

- Post Closure Land Use Plan for Mission Bay South Shores Phase III (RDI&A, RBF/Sholders and Sanford, Woodward-Clyde Consultants and Randall Lamb Consultants; 1995). The post closure land use plan is functionally a Report of Waste Discharge and Post Closure Maintenance Plan for the landfill.
- Order 97-11, General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills Within the San Diego Region (RWQCB, 1997). The landfill owner, the City ESD, is required to comply with the Waste Discharge Requirements (WDRs) and Monitoring and Reporting Program (M&RP) presented in Order 97-11.

The City ESD performs groundwater and surface water detection monitoring at the frequency required by Order 97-11. The City has two groundwater monitoring wells on the perimeter of the landfill in the vicinity of the proposed SeaWorld expansion. The data collected by the City has not indicated a landfill release to groundwater in the vicinity of the proposed expansion area. The City has also collected landfill gas data that indicate the landfill generates minor quantities of landfill gas (verbal communication between T. Mulder of IT and City ESD staff).

In 1997, SeaWorld contracted Fluor Daniel GTI (FDGTI) to perform a Phase II Environmental Assessment of the land east of the existing adventure park and north of the landfill. FDGTI drilled and constructed six groundwater monitoring wells, and sampled and analyzed groundwater from the wells. The results indicated low concentrations of acetone and 2-butanone (MEK) were present in soil, and trace concentrations of 1,1,1-trichloroethane (1,1,1-TCA) were present in groundwater. Acetone had a maximum soil concentration of 220 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) (220 parts per billion by weight [ppb]). MEK was detected once in soil at a concentration of 36 ppb. 1,1,1-TCA had a maximum concentration of 7.2 micrograms per liter ( $\mu\text{g}/\text{L}$ ) (7.2 ppb) in groundwater. FDGTI also detected hydrogen sulfide gas (9 parts per million by volume [ppmv]) and methane (1,000 ppmv) in one soil boring at a depth of 35 feet.

Ms. Rebecca Lafreniere

3

July 20, 2001

The RWQCB has requested that the City ESD and SeaWorld jointly gauge and sample their respective wells to provide an up-to-date "snapshot" of groundwater elevations and groundwater concentrations. The joint monitoring event occurred in the week of July 9, 2001.

Based on the 1997 groundwater data from eight groundwater monitoring wells in the vicinity of the proposed development, IT concludes that the detectable volatile organic compounds (VOCs) in groundwater are present only at trace concentrations, and the low groundwater VOC concentrations do not indicate a significant human health risk to the proposed development. This conclusion should be re-evaluated after the joint groundwater data are available.

SeaWorld design and engineering staff plan to address soil gas concerns in two ways. First, this soil gas survey will be performed to determine if landfill gas impacts exist in the expansion area, and to determine the nature and extent of detectable soil gas parameters of concern. Second, if soil gas issues are identified, then proper mitigation measures will be designed and incorporated into the grading and construction plans. Soil and soil gas screening will be performed during grading and construction activities to monitor worker health and safety. The work proposed here will accomplish the first measure and allow planning of the second measure.

---

### Soil Vapor Assessment Work Plan

The soil vapor assessment work plan proposed here was designed after four applicable or appropriate references.

---

- *County of San Diego, 2000. SAM Manual 2000. Prepared by Department of Environmental Health (DEH) Site Assessment and Mitigation (SAM) Division. Section 5 of the SAM Manual provide guidance on site assessment techniques for soil gas surveys.*
- *County of San Diego, 2001. Draft Guideline for Laboratory Analysis of Soil Gas Samples. Prepared by DEH SAM, dated May 21. The guideline is intended for use whenever soil gas samples are collected for purposes of a human health risk assessment to be submitted to SAM.*
- *South Coast Air Quality Management District (SCAQMD), 2000. Rule 1150.1. Control of Gaseous Emissions from Municipal Solid Waste Landfills. Rule 1150.1 provides a useful set of rules for monitoring, sampling and analyzing landfill gas.*
- *Los Angeles RWQCB, 1997. Interim Guidance for Active Soil Gas Investigation.*

The LFG parameters of concern include the potential fire/explosive potential of methane and the health risk exposure hazards of hydrogen sulfide and VOCs. The primary LFG components to be evaluated are the following.

Parameters of Concern	
Parameter	Analytical Method
Methane (CH <sub>4</sub> )	Fixed or mobile lab analysis by gas chromatograph (GC) (EPA Method 18) or combustion analysis (EPA Method 25).
Hydrogen sulfide (H <sub>2</sub> S)	Fixed or mobile lab analysis by sulfur chemiluminescence (SCAQMD Method 307-91) or flame photo ionization detector (FPD) (Air Resources Board [ARB] Method 16).
Volatile organic compounds (VOCs) <sup>a</sup>	Fixed or mobile lab analysis by GC/MS (County of San Diego, 2001).

<sup>a</sup> – Benzene, benzyl chloride, chlorobenzene, 1,2-dibromoethane (ethylene dibromide), dichlorobenzene, 1,1-dichloroethane (1,1-DCA), 1,2-DCA, 1,1-dichloroethene (1,1-DCE), cis-1,1-DCE, trans-1,1-DCE, dichloromethane (methylene chloride), tetrachloroethene (PCE), tetrachloromethane (carbon tetrachloride), toluene, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-TCA, trichloroethene (TCE), trichloromethane (chloroform), vinyl chloride, xylene, Freon 11, Freon 12, and Freon 113.

Additional LFG components shall be collected to evaluate the nature and extent of soil gas conditions.

Parameters of Interest	
Parameter	Analytical Method
Methane (CH <sub>4</sub> )	Field meter analysis by <i>Landtec GEM 500</i> (or equivalent meter) or flame ionization detector (FID) (methods in Rule 1150.1)
Carbon dioxide (CO <sub>2</sub> )	Field meter analysis by <i>Landtec GEM 500</i> (or equivalent meter) (method in Rule 1150.1) Fixed or mobile lab analysis by GC (EPA Method 18) or combustion analysis (EPA Method 25).
Oxygen (O <sub>2</sub> )	Field meter analysis by <i>Landtec GEM 500</i> (or equivalent meter) (method in Rule 1150.1) Fixed or mobile lab analysis by GC (EPA Method 18) or combustion analysis (EPA Method 25).
Hydrogen sulfide (H <sub>2</sub> S)	Field meter analysis by <i>Jerome 631X</i> (or equivalent meter)
Total organic compounds (TOC)	Field meter analysis measured as methane by flame ionization detector (FID) (method in Rule 1150.1)
Total non-methane organic compounds (NMOC)	Fixed or mobile lab analysis by GC (EPA Method 18) or combustion analysis (EPA Method 25).

Ms. Rebecca Lafreniere

5

July 20, 2001

Sample spacing and depth. Active soil vapor samples will be collected from a depth of 5- and 15-feet, from temporary soil vapor probes spaced approximately 100 feet apart, at the approximate locations illustrated in Figure 1. The temporary soil vapor probes will be placed using a truck-mounted hydraulic-drive equipment, and left in place no longer than two to three days. No borings will be advanced below the water table, which is between 10- and 20-feet below grade. Because of the shallow water table, the proposed 15-foot depth of vapor sampling may actually be shallower at some locations.

In this field investigation, no permanent vapor monitoring points will be constructed. The need for permanent vapor sampling probes will be evaluated later, after evaluating the results of this investigation. The LEA may request the City ESD to install permanent LFG monitoring probes on the perimeter of the landfill, in accordance with Division 2, Title 27, which is the combined State Water Resources Control Board/California Integrated Waste Management Board (SWRCB/CIWMB) regulations for solid waste.

Timing. The proximity to Mission Bay makes it likely that there are tidal fluctuations in groundwater. During the period of falling groundwater levels, the soil may intake air from the ground surface. During the period of rising water levels the soil may exhaust soil vapor to the ground surface. In order to detect the highest concentrations, the soil-vapor samples will be collected during period of rising tides.

Purging. A minimum of three volumes of vapor will be withdrawn prior to sampling to purge the vapor probe and sampling device of ambient air, and purging will continue until the TOC concentration remains constant for at least 30 seconds. If the soil has insufficient permeability to purge as described above, then a lower volume purge may be necessary.

Reproducibility and Representativeness. All data will be collected and analyzed in a uniform manner to ensure the samples are reproducible and representative.

Sample documentation. Field personnel will document all field activities on Field Activity Daily Logs (FADLs), sample collection logs, and chain-of-custody (COC) forms.

The COC form shall accompany the bag samples. Each time a bag changes hands, it shall be logged on the custody sheet with the time of custody transfer recorded. Laboratory personnel shall record the condition of the sample (full, three-fourths full, one-half full, one-fourth full or empty).

Several of the sample locations will be surveyed to establish ground coordinates to within 0.1 feet horizontal and 0.01 feet vertical. The remaining sample locations will be documented by measuring distances of probes from surveyed points.

Ms. Rebecca Lafreniere

6

July 20, 2001

Sampling and Analysis. All gas probes at each depth shall be monitored for methane, CO<sub>2</sub>, O<sub>2</sub> and balance gas (primarily nitrogen) using a *Landtec GEM 500* LFG meter or equivalent meter. At each boring the sample with the highest methane concentration (measured by field meter) will be analyzed for TOC measured as methane using a portable flame ionization detector (FID) meeting the requirements of Section 3.2 of Rule 1150.1.

If the probe TOC concentration exceeds five percent methane, then a vapor sample from that probe will be analyzed at a fixed base lab for methane, H<sub>2</sub>S, VOCs, CO<sub>2</sub>, O<sub>2</sub> and NMOCs.

If the TOC does not exceed 5% by volume in any of the probes, then bag samples will be collected from the four probes with the highest methane concentration. Those four samples will be analyzed at a fixed base lab for methane, H<sub>2</sub>S, VOCs, CO<sub>2</sub>, O<sub>2</sub> and NMOCs.

All samples will be analyzed using the methods described in the tables above. Note that the table describes multiple methods for some analyses. To ensure that the sample results are reproducible and comparable, a single method will be selected and used throughout the project.

The bag samples shall be kept in light-sealed containers to avoid photochemical reactions and shall be analyzed no later than 72 hours after collection.

Analyses. The field analyses will be performed in accordance with procedures in Rule 1150.1 and the instrument manufacturer's calibration and operation instructions. The fixed base or mobile laboratory analyses will be performed at a laboratory that is certified by the California Department of Health Services (DOHS) Environmental Laboratory Accreditation Program (ELAP), using the analytical methods listed in the above tables.

Report. IT will prepare a report to describe the field procedures and analytical results. The soil vapor sampling locations will be illustrated on a topographic map drawn to scale. The analytical results will be presented in tabular format and illustrated by means of isopleth maps, as appropriate.

Ms. Rebecca Lafreniere

7

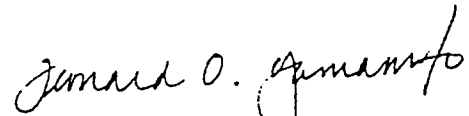
July 20, 2001

We look forward to receiving your review comments by August 3, 2001. If you have any questions, please call Tom Mulder at 619.533.7302.

Sincerely,  
IT Corporation



Thomas J. Mulder, RG, CEG, CHG  
Project Manager



FOR Wayne Nakagawa, PE  
Chemical Engineer

TJM:kae

enclosures      Figure 1, Site Plan and Proposed Soil Vapor Survey Sample Location

c: Craig Carlisle, RWQCB  
John Odermatt, RWQCB  
Robert Ferrier, City ESD  
Chris Gonaver, City ESD  
George Morton, City ESD  
Ray Purtee, City ESD  
Diana Buchanan, IT Corp  
Patrick Owen, SeaWorld  
Greg Gourley, Sea World  
Kevin Carr, SeaWorld  
David Watson, Gray Cary  
Robert Longstreth, Gray Cary  
TJM/KSR/WN/JD/file/chron

DRAWING NUMBER 828286-81

APPROVED BY

CHECKED BY

DRAWN BY

DATE

MISSION BAY

PROPOSED TIER 1 PROJECT  
SPLASHDOWN RIDE

# LEGEND:

- MBW-2  
● CITY ESD GROUNDWATER MONITORING WELL
- LE-2  
◆ SEA WORLD GROUNDWATER MONITORING WELL
- WA-1  
■ ABANDONED GROUNDWATER MONITORING WELL
- PROPOSED SOIL VAPOR SAMPLING LOCATION

## NOTE:

BASE MAP PROVIDED BY PGAV, INC. LAND SURV.  
DATA REPORTED TO BE FROM HALE ENGINEERING  
SURVEYED AUGUST, 2000

## UTILITY NOTE:

UNDERGROUND UTILITY LINES SHOWN ON THIS PLAN  
ARE DERIVED FROM RECORDS OF INFORMATION  
PROVIDED BY SEA WORLD. LOCATION OF SURFACE  
SURFACE FEATURES AND THEIR GRADES ARE ACTUAL  
LOCATIONS. LOCATION OF UNDERGROUND UTILITIES  
MUST BE VERIFIED PRIOR TO CONSTRUCTION

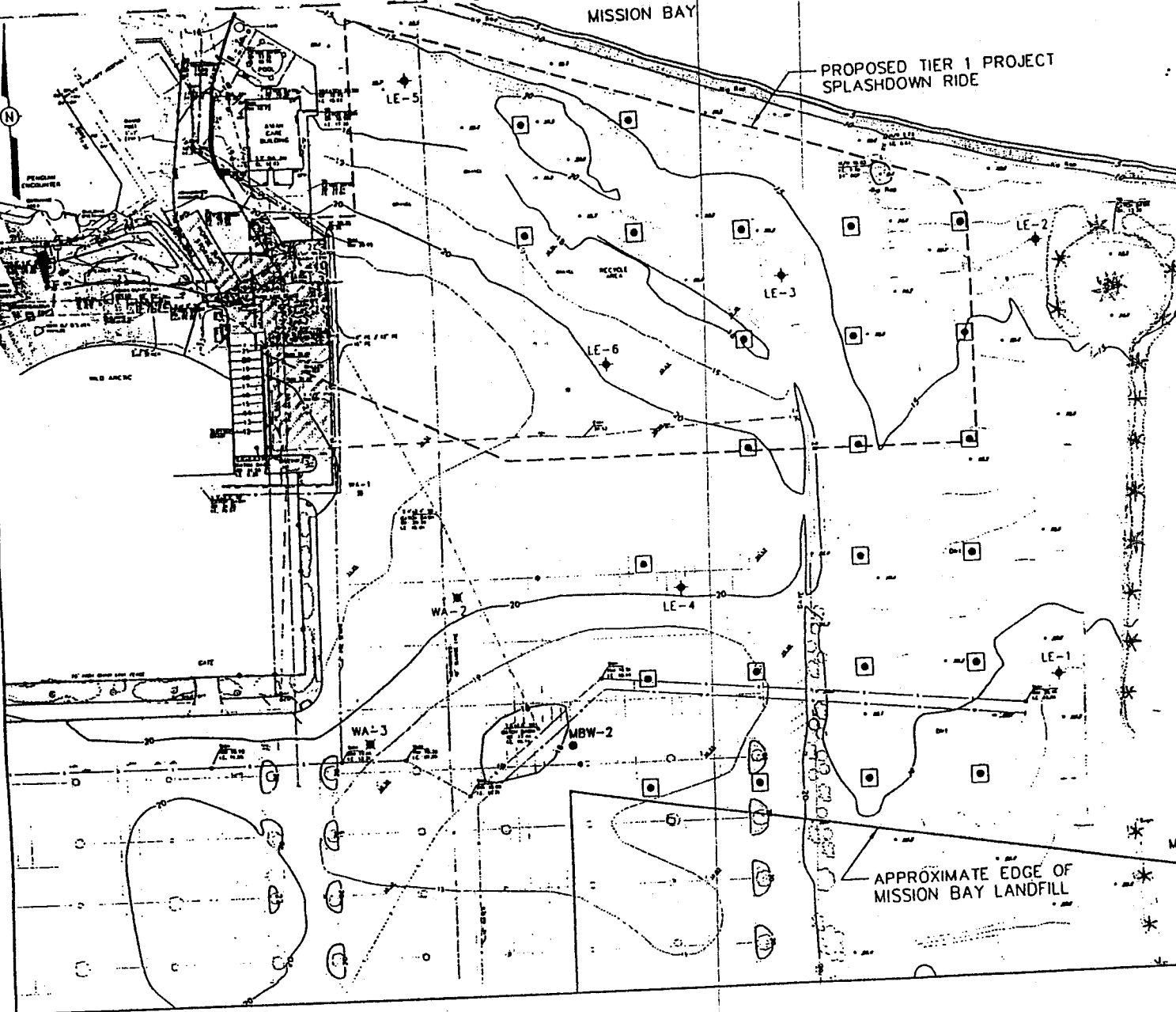
## BENCHMARK:

ELEVATIONS SHOWN ON THIS PLAN ARE ON  
"SEA WORLD DATUM" (SWD). MEAN SEA LEVEL  
PER CITY OF SAN DIEGO IS REFERENCED AS  
FOLLOWS: CITY OF SAN DIEGO ENGINEER'S BRASS  
DISK IN THE NORTHWEST CORNER OF CONCRETE  
BOAT RAMP AT SOUTH SHORES PARK.  
ELEVATION 6.68 MSL = 9.82 SWD



SEA WORLD  
404 SEA WORLD DRIVE  
SAN DIEGO, CALIFORNIA

FIGURE 1  
SITE PLAN AND  
PROPOSED SOIL VAPOR SURVEY  
SAMPLE LOCATION







CHRISTIAN WHEELER  
ENGINEERING

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

PROPOSED ATLANTIS WATER RIDE PROJECT  
SEA WORLD ENTERTAINMENT PARK  
SAN DIEGO, CALIFORNIA

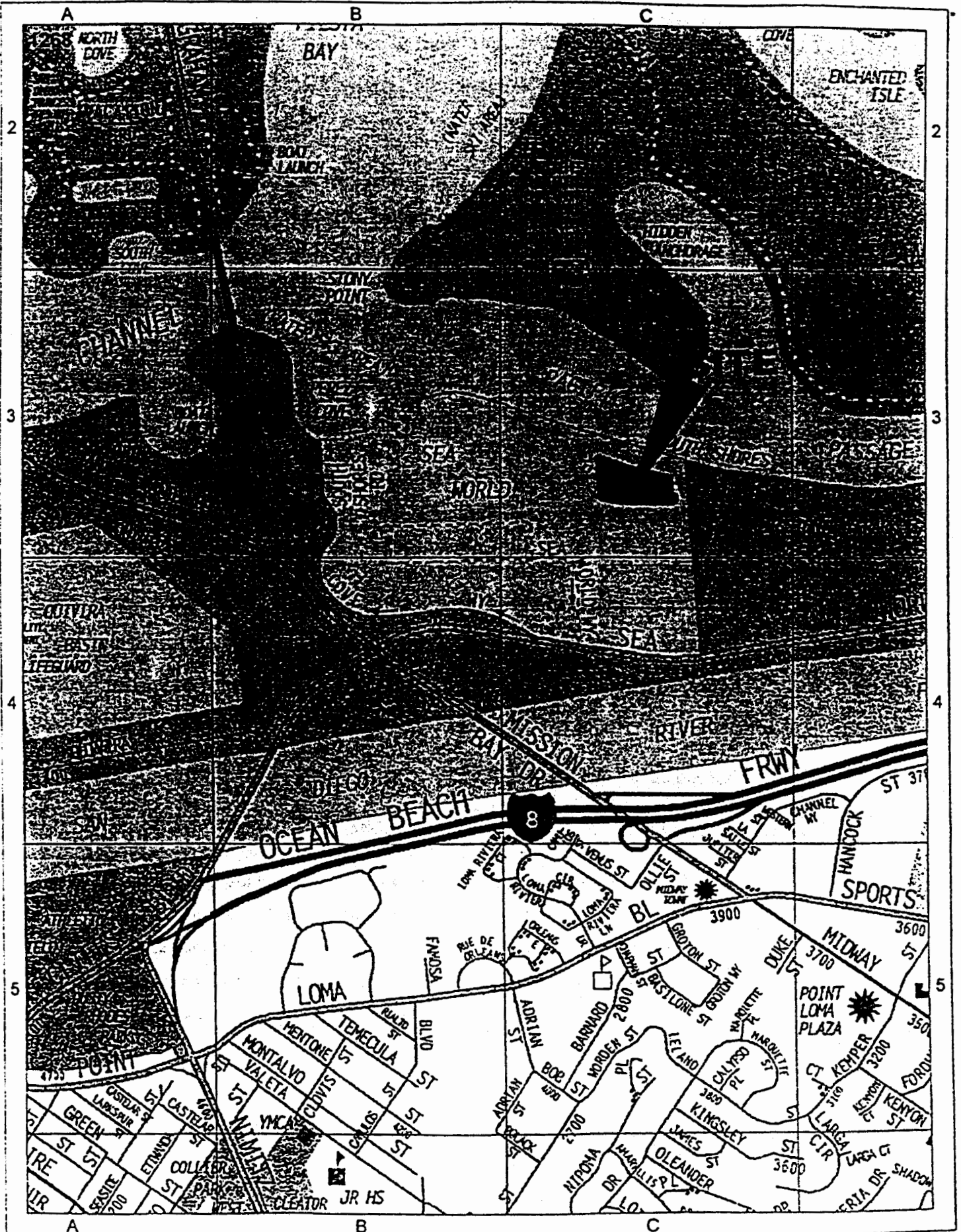
INTRODUCTION AND PROJECT DESCRIPTION

This report presents the results of our preliminary geotechnical investigation for the proposed Atlantis splash water ride project at the SeaWorld Entertainment Park, located on South Shores Drive, in San Diego, California. The following Plate No. 1 presents a vicinity map showing the location of the site.

The site of the subject project is located at the northeast corner of the Sea World leased property, in the Mission Bay area of San Diego, California. Most of the project area is relatively level and presently being used as a storage area for park support facilities, and as such, supports several temporary structures.

We understand that the proposed project is to consist of a major splash ride that will include the structural elements described below. It should be noted, however, that the project is still evolving and that some of the structural elements described below may change.

- **Ride Lift Tower:** The ride lift tower will be a relatively light, steel-frame structure that will be approximately 95 feet above exterior grade. The total static load of this structure is estimated to be 1,500 kips, with a mat foundation contact pressure of approximately 760 pounds per square foot. The exterior of the structure will consist of a light-gauge metal skin with vertical studs attached to the structural steel frame. The tower will have an inside elevator system to lift the ride cars to a track located near the top. A water channel for the ride cars will enter the structure on the west side. This channel will extend about 11 feet below the exterior grade. The bottom of the channel will coincide with the top of the concrete mat foundation. This tower will be structurally tied to the other two at various levels by structural elements and the elevated ride tracks.



- **Ride Drop Tower:** The ride drop tower, located west of the ride lift tower, supports the water slide where the ride cars drop about 60 feet to a shallow artificial lake. This structure will also be approximately 80 feet high and will be a relatively light, steel-frame structure with a light-gauge metal skin. The total static load of this structure is estimated to be 730 kips, with a mat foundation contact pressure of about 730 pounds per square foot. The same water channel that enters the lift tower passes through the center of this structure; however, the depth of the channel as it passes through this structure will only be about six to nine feet below the exterior grade. The above-grade ride tracks and a footbridge will connect the drop tower and the main tower.
- **Stair Tower:** The stair tower will be located northeast of the ride lift tower and will be about 85 feet high. This tower supports the above-grade ride tracks and has an interior stairway for maintenance and emergency exit. It will be connected to the elevator tower by the ride tracks at two levels and by a footbridge. This structure will also be a relatively light, steel-frame structure with a light-gauge metal skin, that will have a total static load of 740 kips and a mat foundation contact pressure of 560 pounds per square foot.
- **Elevated Ride Track:** The elevated ride track is a roller coaster type track that varies in height from zero to 77 feet above the ground surface. The track will be supported by steel columns, which, in turn, are supported by a partial concrete mat foundation system. Column static loads are expected to be 4.0 kips. Including the weight of the foundations, the total static load of 27 kips is estimated for each column, with a mat foundation contact pressure of 350 pounds per square foot.
- **Ride Water Channels:** The at-grade ride water channels wind through portions of the ride and through the two artificial lakes. These elements will be reinforced concrete structures about six feet deep. Static track loads in the ride water channels are estimated to be about 4.5 kips per linear foot. The bottom of the channel will act as a mat foundation system, which will have an estimated static contact pressure of approximately 560 pounds per square foot.
- **Artificial Lakes:** Two artificial lakes, approximately 4 feet deep, will be included in the construction. One lake will be located west of the drop tower and the other will be

Mulder, Tom

---

From: Ray Purtee [RYP@sdcity.sannet.gov]  
Sent: Friday, August 03, 2001 3:56 PM  
To: tmulder@theitgroup.com  
Subject: Soil Vapor Assessment Workplan

Our only comment to the workplan is to the third paragraph of page 2: since 1962 there has been additional cover material placed on the site in question. Without doing research, I cannot quantify how much additional cover has been placed. The point I'm making is that the area has not sat untended since 1962.



CITY OF SAN DIEGO SOLID WASTE LOCAL ENFORCEMENT AGENCY (LEA)  
1222 First Avenue, MS 501 • San Diego, CA 92101-4155 • Tel (619) 446-5002 • Fax (619) 446-5001

August 24, 2001

Mr. Thomas Mulder, Project Manager  
IT Corporation  
1230 Columbia Street, Suite 1200  
San Diego, CA 92101-8517

Faxed: 619-239-1238

Dear Mr. Mulder:

Subject: Work Plan for Soil Vapor Assessment, Sea World Expansion Plan, 16-Acre Tract

Per our telephone conversation earlier this month, the City of San Diego Solid Waste Local Enforcement Agency (LEA) has reviewed the proposed Sea World Soil Vapor Assessment Work Plan. To better assess the site in respect to potential landfill influences, the western end and northwest end of the landfill requires additional sampling locations. The LEA is requesting that a minimum of four additional sampling locations be added to the proposal to address these areas. Please submit a revised sampling location map identifying the new sampling locations.

Should you have any questions or would like to discuss this further, please contact me at (619) 446-5005.

Sincerely,

*Rebecca Lafreniere*  
Rebecca Lafreniere  
Solid Waste Inspector III

Cc: John Odermatt, RWQCB  
Robert Ferrier, City ESD  
Ray Purtee, City ESD  
Patrick Owen, Sea World  
Kevin Carr, Sea World



**IT Corporation**

1230 Columbia Street, Suite 1200  
San Diego, CA 92101-8517  
Tel. 619.239.1690  
Fax. 619.239.1238

A Member of The IT Group

October 18, 2001

IT Corporation Project 830418

Ms. Rebecca Lafreniere  
Solid Waste Local Enforcement Agency  
City of San Diego  
1222 First Avenue, MS 501  
San Diego, CA 92101-4155

Work Plan for Soil Vapor Assessment  
Response to LEA Comments  
SeaWorld Expansion Plan, 16-Acre Tract

Dear Ms. Lafreniere:

In response to your comments of August 24, 2001, IT Corporation (IT) has added four soil vapor probe locations to the Work Plan for Soil Vapor Assessment. The four additional locations will be on the west and northwest side of the landfill. Enclosed is a revised site plan that shows all twenty-eight proposed vapor-probe locations.

IT plans to begin the field work on October 22, and anticipates completing the field work by October 31, 2001.

If you have any questions, please call Tom Mulder at 619.533.7302.

Sincerely,  
IT Corporation

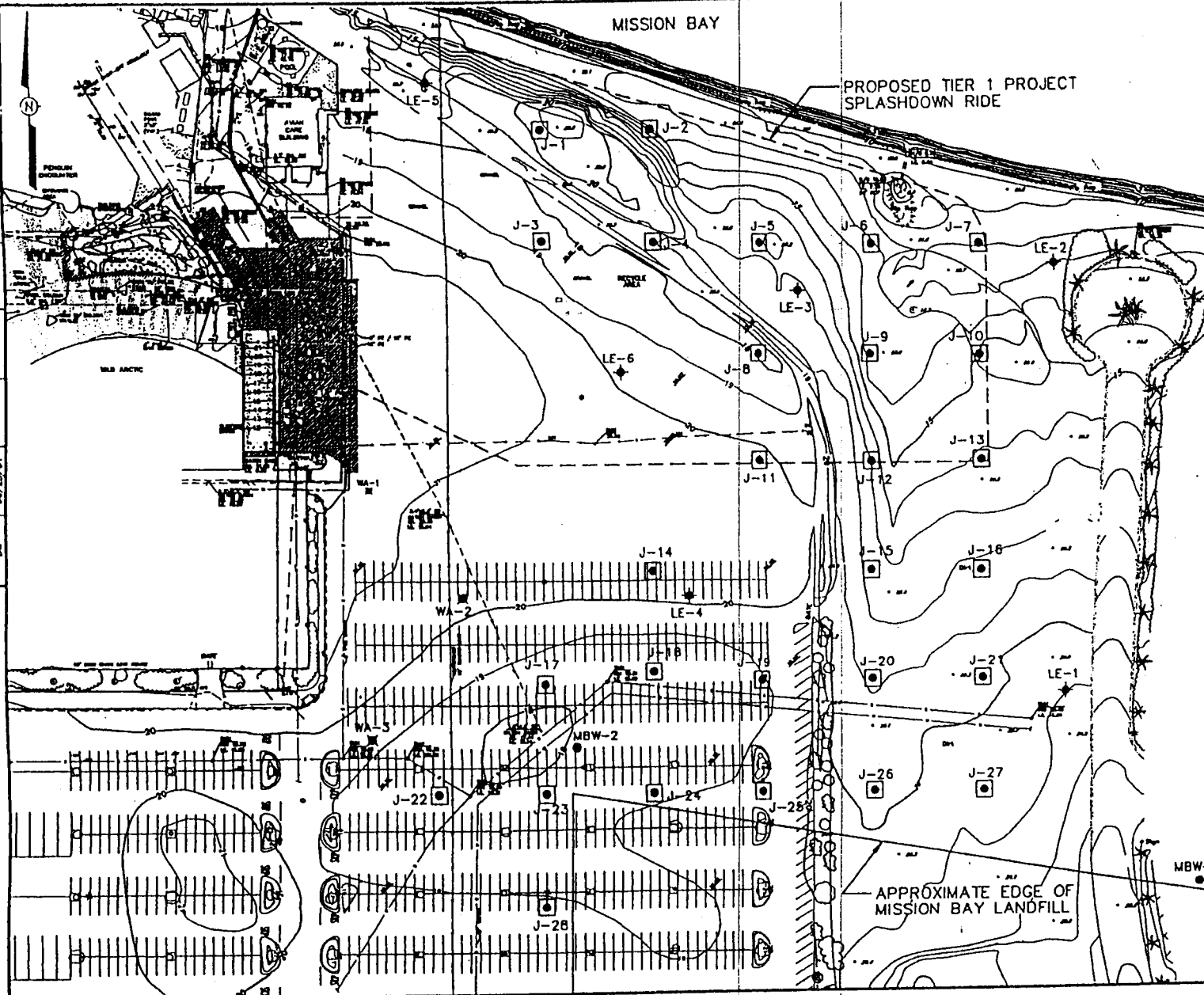
A handwritten signature in dark ink, appearing to be 'TJM', written over a horizontal line.

Thomas J. Mulder, RG, CEG, CHG  
Project Manager  
TJM:kae

enclosure

c: Craig Carlisle, RWQCB  
John Odermatt, RWQCB  
Robert Ferrier, City ESD  
Ray Purtee, City ESD  
Patrick Owen, SeaWorld  
Greg Gourley, Sea World  
Kevin Carr, SeaWorld  
Robert Longstreth, Gray Cary

UNAWN 51  
DATE 06/25/01  
SHEET 1 OF 1  
NUMBER 102000-01



**LEGEND:**

- MBW-2  
● CITY ESD GROUNDWATER MONITORING WELL
- LE-2  
◆ SEA WORLD GROUNDWATER MONITORING WELL
- WA-1  
■ ABANDONED GROUNDWATER MONITORING WELL
- J-3  
□ PROPOSED SOIL VAPOR SAMPLING LOCATION

**NOTE:**

BASE MAP PROVIDED BY PCAV, INC. LAND SURVEY DATA REPORTED TO BE FROM MALE ENGINEERING SURVEYED AUGUST, 2000


**UTILITY NOTE:**

UNDERGROUND UTILITY LINES SHOWN ON THIS PLAN ARE DERIVED FROM RECORDS OF INFORMATION PROVIDED BY SEA WORLD. LOCATION OF SURFACE SURFACE FEATURES AND THEIR GRADES ARE ACTUAL LOCATIONS. LOCATION OF UNDERGROUND UTILITIES MUST BE VERIFIED PRIOR TO CONSTRUCTION.

**BENCHMARK:**

ELEVATIONS SHOWN ON THIS PLAN ARE ON "SEA WORLD DATUM" (SWD). MEAN SEA LEVEL PER CITY OF SAN DIEGO IS REFERENCED AS FOLLOWS: CITY OF SAN DIEGO ENGINEER'S BRASS DISK IN THE NORTHWEST CORNER OF CONCRETE BOAT RAMP AT SOUTH SHORES PARK. ELEVATION 6.68 MSL = 9.82 SWD

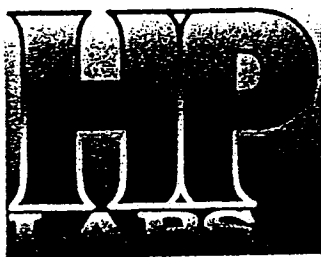


 ITT CORPORATION	SEAWORLD 800 SEAWORLD DRIVE SAN DIEGO, CALIFORNIA
	<b>FIGURE 1, SITE PLAN AND FINAL PROPOSED SOIL VAPOR SURVEY SAMPLE LOCATION</b>

**APPENDIX B**  
**LABORATORY ANALYTICAL REPORT AND CHAIN-OF-CUSTODY**

---





11/9/01

IT Corporation  
1230 Columbia Street, Suite 1200  
San Diego, CA 92101

Project Name: Sea World  
Project No.:

Attention: Mr. Tom Mulder

The following sample(s) were received and analyzed:

<u>Date Received</u>	<u>Quantity</u>	<u>Matrix</u>
10/26/01	5	Vapor

---

The samples were analyzed by one or more of the EPA methodologies or equivalent methods listed below.

---

VOCs -- EPA Method 8260

The results are included with a summary of the quality control procedures. Please note that the symbol "nd" indicates a value below the reporting limit for the particular compound in the sample.

Please feel free to call us to discuss any part of this report or to schedule future projects.

Sincerely,

  
Tamara Davis  
Lab Director

Mobile One Laboratories is certified by the California Department of Health Services (certificate #s: 1194, 1561, 1921, 2088, 2278).

HP Labs Project # IT102601-10

Report Summary  
Narrative

Client: IT Corporation  
Project: Sea World

Matrix: vapor  
Units: ug/L

Date Analyzed: October 26, 2001

Since the analysis of benzyl chloride was requested for these samples and it is a compound not normally associated with the EPA Method 8260 calibration, it was searched as a tentatively identified compound (TIC). Each sample chromatogram was searched for the three ions associated with benzyl chloride (from the NSIT Library). Benzyl chloride was not identified in any of the samples.

IT102601-10

# Report Summary

EPA Method 8260B ( 5030 Prep.)

Matrix: vapor  
Units: ug/L

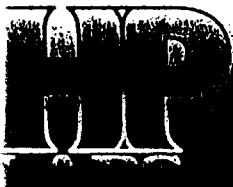
Client: IT Corporation  
Project: Sea World

Sample Name:  
Analysis Date  
Analysis Time  
Dilution Factor:

J-2 s	J-14 d	J-21 s	J-24 d	J-28 s	Method Blank
26 Oct 2001	26 Oct 2001	26 Oct 2001	26 Oct 2001	26 Oct 2001	26 Oct 2001
12:43 pm	1:27 pm	1:05 pm	2:31 pm	2:07 pm	11:40 am
0.05	0.05	0.05	0.05	0.05	0.05

Compound	E.Q.L	Amount Found	Amount Found	Amount Found	Amount Found	Amount Found	Amount Found
Dichlorodifluoromethane	1	nd	nd	nd	nd	nd	nd
Vinyl Chloride	1	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	1	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	1	nd	nd	nd	nd	nd	nd
Methylene Chloride	1	nd	nd	nd	nd	nd	nd
Freon-113	1	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	1	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	1	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	1	nd	nd	nd	nd	nd	nd
Chloroform	1	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	1	nd	nd	nd	nd	nd	nd
Carbon Tetrachloride	1	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane	1	nd	nd	nd	nd	nd	nd
Benzene	1	nd	nd	nd	nd	nd	nd
Trichloroethene	1	nd	nd	nd	nd	nd	nd
Toluene	1	nd	nd	nd	nd	nd	nd
1,1,2-Trichloroethane	1	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane	1	nd	nd	nd	nd	nd	nd
Tetrachloroethene	1	nd	nd	nd	nd	nd	nd
Chlorobenzene	1	nd	nd	nd	nd	nd	nd
m,p-Xylene	1	nd	nd	nd	nd	nd	nd
o-Xylene	1	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	1	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	1	nd	nd	nd	nd	nd	nd
Surrogates	Spiked	QC Limits(% Rec.)		Percent Recovery			
DBFM	50 ng	75-125	98	106	102	102	98
1,2-DCA-d4	50 ng	70-130	99	104	100	98	97
Toluene - d8	50 ng	75-125	92	96	99	96	95
1,4-BFB	50 ng	75-125	89	94	90	91	89

Analyses performed by: Mark Lathrop



Calibration Verification  
EPA Method 8260B

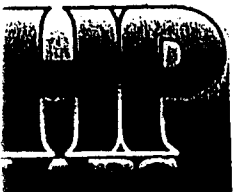
Client: IT Corporation  
Project: Sea World

Matrix: vapor  
Units: ug/L

Sample Name: CCV  
Analysis Date: 26 Oct 2001  
Analysis Time: 11:08 am  
Dilution Factor: 1

Compound		Amount Found	Percent Diff	CCC (-20 to +20%)	EPA 8260 (-20 to +20%)
				Pass	Pass
Dichlorodifluoromethane		58	16		yes
Chloromethane		55	9		yes
Vinyl Chloride	CCC	57	14	yes	yes
Bromomethane		61	22		no
Chloroethane		59	18		yes
Trichlorofluoromethane		59	19		yes
1,1-Dichloroethene	CCC	50	1	yes	yes
Methylene Chloride		49	-3		yes
Freon-113		40	-20		no
trans-1,2-Dichloroethene		50	0		yes
1,1-Dichloroethane		54	8		yes
2,2-Dichloropropane		54	8		yes
cis-1,2-Dichloroethene		50	0		yes
Chloroform	CCC	53	6	yes	yes
Bromochloromethane		50	0		yes
1,1,1-Trichloroethane		51	2		yes
1,1-Dichloropropene		53	5		yes
Carbon Tetrachloride		51	3		yes
1,2-Dichloroethane		55	10		yes
Benzene		53	7		yes
Trichloroethene		51	1		yes
1,2-Dichloropropane	CCC	50	1	yes	yes
Bromodichloromethane		51	1		yes
Dibromomethane		51	2		yes
cis-1,3-Dichloropropene		49	-2		yes
Toluene	CCC	48	-4	yes	yes
trans-1,3-Dichloropropene		50	-1		yes
1,1,2-Trichloroethane		49	-2		yes
1,2-Dibromoethane		48	-3		yes
1,3-Dichloropropane		49	-1		yes





## Footnote Summary

<u>Footnote</u>	<u>Definition</u>
E.Q.L.	Estimated Quantitation Limit
nd	Not detected above the E.Q.L. or detection limit.
J	The concentration reported is between the Method Detection Limit and the E.Q.L.
D	Concentration reported from a secondary dilution; E.Q.L.s adjusted accordingly.
B	Analyte found in the associated blank.
E	Analyte amount exceeds calibration range. Amount quantitated by extrapolation.
***	MS/MSD, LCS/LCSD recovery is outside QC range; no corrective action taken.
M	Surrogate recovery outside QC range due to matrix interference.
S	Because of necessary sample dilution, value was outside QC limits.
&	Gasoline range organics not identified as gasoline.
#	Diesel range organics not identified as diesel.
**	This compound has been screened by EPA method 8020. Any positive results should be confirmed by a second analysis.

**ANALYSIS REQUEST AND  
CHAIN OF CUSTODY RECORD \***

Reference Document No. 514597  
Page 1 of 1

Project Name/No. <sup>1</sup> SeaWorld  
Team Members <sup>2</sup> J. DeWoody / S. Ceniga  
Profit Center No. <sup>3</sup> /  
Project Manager <sup>4</sup> Tom Mulder  
Purchase Order No. <sup>6</sup> 181761 OP  
Required Report Date <sup>11</sup> 10/30/01

Samples Shipment Date <sup>7</sup> 10/25/01  
Lab Destination <sup>8</sup> HP Lab  
Lab Contact <sup>9</sup> Blayne H.  
Project Contact/Phone <sup>12</sup> Tom Mulder 619-533-7302  
Carrier/Waybill No. <sup>13</sup> Fed ex

Bill to: <sup>5</sup> IT Corp.  
San Diego  
Report to: <sup>10</sup> IT Corp.  
1230 Columbia St. Ste 1200  
San Diego CA 92101  
fax 619-239-1238

**ONE CONTAINER PER LINE**

Sample Number <sup>14</sup>	Sample Description/Type <sup>15</sup>	Date/Time Collected <sup>16</sup>	Container Type <sup>17</sup>	Sample Volume <sup>18</sup>	Pre-servative <sup>19</sup>	Requested Testing Program <sup>20</sup>	Condition on Receipt <sup>21</sup>	Disposal Record No. <sup>22</sup>
2 S	Air	10/25/01 0650	1 L Tedlar bag		Dark	VOCs by GC/MS SD County-2001 GC/MS		
14 d		10/25/01 0730					FOR LAB USE ONLY	
21 S		10/25/01 0655						
28 S		10/25/01 0710						
24 d		10/25/01 0725					FOR LAB USE ONLY	

Special Instructions: <sup>23</sup>

Possible Hazard Identification: <sup>24</sup>

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: <sup>25</sup>

Return to Client ☐ Disposal by Lab ☒ Archive \_\_\_\_\_ (mos.)

turnaround Time Required: <sup>26</sup>

Normal ☐ Rush ☒

QC Level: <sup>27</sup>

I. ☐ II. ☐ III. ☐

Project Specific (specify): \_\_\_\_\_

Relinquished by <sup>28</sup> Sarah Ceniga  
(Signature/Affiliation)

Date: 10/25/01  
Time: 1500

1. Received by <sup>28</sup>  
(Signature/Affiliation)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

Relinquished by  
(Signature/Affiliation)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

2. Received by  
(Signature/Affiliation)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

Relinquished by  
(Signature/Affiliation)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

3. Received by  
(Signature/Affiliation)

Date: \_\_\_\_\_  
Time: \_\_\_\_\_

Comments: <sup>29</sup>

Analyze and report VOCs on attached list - by GC/MS

Write: To accompany samples

Yellow: Field copy

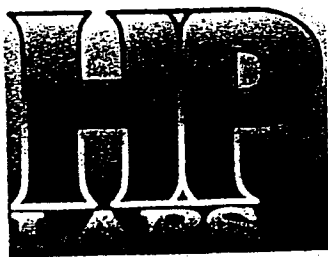
\* See back of form for special instructions.

Benzene; benzyl chloride, chlorobenzene, 1,2-dibromoethane (ethylene dibromide), dichlorobenzene, 1,1-dichloroethane (1,1-DCE), 1,2-DCE, 1,1-dichloroethene (1,1-DCE), cis-1,2-DCE, trans-1,2-DCE, dichloromethane (methylene chloride), tetrachloroethene (PCE), tetrachloromethane (carbon tetrachloride), toluene, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-TCA, trichloroethene (TCE), trichloromethane (chloroform), vinyl chloride, xylene, Freon 11, Freon 12, and Freon 113

Analyzer + Report above VOCs

COC # 514597 10/25/01





Monday, November 19, 2001

Tom Mulder  
IT Corporation  
1230 Columbia Street, Suite 1200  
San Diego, CA 92101-8517

Dear Mr. Mulder:

This letter is in regards to the chain of custody for project number 181761 OP at Sea World (see copy enclosed). It has come to our attention the chain of custody was not signed "received" by HP Labs. These sample were indeed received by us via Fed Ex on 10/25/01. They arrived at our lab on 10/26/01 at 9:45 Am, and were analyzed that same day. Please except our apologies for this oversight. If there is anything we can do to help further please call us.

Sincerely,

A handwritten signature in cursive script that reads 'Louise Adams'.

Louise Adams  
Operations Manager



INTERNATIONAL  
TECHNOLOGY  
CORPORATION

# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD\*

Reference Document No. 514597

Page 1 of 1

Project Name/No. 1 SeaWorld  
 Sample Team Members 2 J. DeWoody / S. Ceniga  
 Profit Center No. 3  
 Project Manager 4 Tom Mulder  
 Purchase Order No. 6 181761 OP  
 Required Report Date 11 10/30/01

Samples Shipment Date 7 10/25/01  
 Lab Destination 8 HP Lab  
 Lab Contact 9 Blake H.  
 Project Contact/Phone 12 Tom Mulder 619-533-7302  
 Carrier/Waybill No. 13 FedEx

Bill to: 5 IT Corp.  
San Diego  
 Report to: 10 IT Corp.  
1230 Columbia St. Ste 1200  
San Diego CA 92101  
Fax 619-239-1238

## ONE CONTAINER PER LINE

Sample Number <sup>14</sup>	Sample Description/Type <sup>15</sup>	Date/Time Collected <sup>16</sup>	Container Type <sup>17</sup>	Sample Volume <sup>18</sup>	Preservative <sup>19</sup>	Requested Testing Program <sup>20</sup>	Condition on Receipt <sup>21</sup>	Disposal Record No.
1-2 S	Air	10/25/01 0650	1L Fedor bag		Dark	VOCs by GC/MS SD County-2001 GC/MS		
1-14 d		10/25/01 0730					FOR LAB USE ONLY	
21 S		10/25/01 0655						
28 S		10/25/01 0710						
24 d		10/25/01 0725					FOR LAB USE ONLY	

COPY

FOR LAB  
USE ONLY

FOR LAB  
USE ONLY

Special Instructions: <sup>23</sup>

Possible Hazard Identification: <sup>24</sup>

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: <sup>25</sup>

Return to Client ☐ Disposal by Lab ☒ Archive \_\_\_\_\_ (mos.)

Turnaround Time Required: <sup>26</sup>

Normal ☒ Rush ☐

QC Level: <sup>27</sup>

I. ☐ II. ☐ III. ☐

Project Specific (specify): \_\_\_\_\_

Relinquished by: <sup>28</sup>  
 (Signature/Affiliation) Sanal Ceniga

Date: 10/25/01  
 Time: 1500

1. Received by <sup>28</sup>  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

2. Relinquished by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

2. Received by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

3. Relinquished by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

3. Received by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Comments: <sup>29</sup>

Analyze and report VOCs on attached list -- by GC/MS



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants  
laboratory services

October 31, 2001

LTR/582/01

Tom Mulder  
IT Corp.  
1230 Columbia St., Ste. 1200  
San Diego, CA 92101

re: Sea World (P.O. No.: 181760 OP)

Dear Tom:

Please find enclosed the laboratory analysis report, quality assurance summary, and the original chain of custody form for five Tedlar bag samples received October 26, 2001.

The samples were analyzed for permanent gases, hydrogen sulfide, and total gaseous non-methane organics (TGNMO) as requested on the chain of custody form.

Sincerely,

AtmAA, Inc.

Michael L. Porter  
Laboratory Director

Encl.  
MLP/bwf



AtmAA Inc.

23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

environmental consultants  
laboratory services

### LABORATORY ANALYSIS REPORT

Permanent Gases, Hydrogen Sulfide, and Total Gaseous Non- Methane  
Organics (TGNMO) Analysis in Tedlar Bag Samples

Report Date: October 31, 2001  
Client: IT Corp.  
Project Location: Sea World  
Client P.O. No.: 181760 OP  
Date Received: October 26, 2001  
Date Analyzed: October 26, 2001

### ANALYSIS DESCRIPTION


Permanent gases were measured by thermal conductivity detection/gas chromatography (TCD/GC). Hydrogen sulfide was analyzed by gas chromatography with a Hall electrolytic conductivity detector operated in the oxidative sulfur mode. Total gaseous non-methane organics (TGNMO) was measured by flame ionization detection/total combustion analysis (FID/TCA), EPA Method 25 analysis.

AtmAA Lab No.:	02991-1	02991-2	02991-3	02991-4	02991-5
Sample I.D.:	J-2s	J-14d	J-21s	J-28s	J-24d

Components	(Concentration in %,v)				
Nitrogen	75.5	76.4	53.5	65.2	60.2
Oxygen	16.2	17.8	9.56	11.3	16.0
Methane	0.43	3.17	21.6	8.97	13.1
Carbon dioxide	7.51	2.95	15.6	14.9	10.9

	(Concentration in ppmv)				
Hydrogen sulfide	<0.3	0.47	9.41	<0.3	1820
Ethane	<1	4.97	14.4	3.46	7.55
TGNMO	4.02	27.3	60.7	132	78.0

The reported oxygen concentration includes any argon present in the sample. Calibration is based on a standard atmosphere containing 20.95% oxygen and 0.93% argon. The accuracy of permanent gas analysis by TCD/GC is +/- 2%, actual results are reported. TGNMO is total gaseous non-methane organics (excluding ethane) measured and reported as ppm methane.

  
Michael L. Porter  
Laboratory Director

# QUALITY ASSURANCE SUMMARY

(Repeat Analyses)

Project Location: Sea World

Date Received: October 26, 2001

Date Analyzed: October 26, 2001

Components	Sample ID	Repeat Analysis		Mean Conc.	% Diff. From Mean
		Run #1	Run #2		
		(Concentration in %,v)			
Nitrogen	J-2s	75.4	75.6	75.5	0.13
	J-21s	53.4	53.6	53.5	0.19
Oxygen	J-2s	16.1	16.2	16.2	0.31
	J-21s	9.54	9.58	9.56	0.21
Methane	J-2s	0.43	0.43	0.43	0.0
	J-21s	21.5	21.7	21.6	0.46
Carbon dioxide	J-2s	7.47	7.55	7.51	0.53
	J-21s	15.5	15.7	15.6	0.64
(Concentration in ppmv)					
Hydrogen sulfide	J-2s	<0.3	<0.3	---	---
	J-14d	0.46	0.48	0.47	2.1
	J-21s	9.28	9.54	9.41	1.4
	J-28s	<0.3	<0.3	---	---
	J-24d	1800	1840	1820	1.1
TGNMO	J-2s	4.03	4.02	4.02	0.12
	J-21s	59.5	61.9	60.7	2.0

Five Tedlar bag samples, laboratory numbers 02991-(1-5), were analyzed for permanent gases, hydrogen sulfide, and TGNMO. Agreement between repeat analyses is a measure of precision and is shown above in the column "% Difference from Mean". Repeat analyses are an important part of AtmAA's quality assurance program. The average % Difference from Mean for 13 repeat measurements from the five Tedlar bag samples is 0.71%.



# ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD \*

Reference Document No. 514555  
Page 1 of 1

Project Name/No. 1 SeaWorld  
 Sole Team Members 2 J. Dewoody / S. Ceniga  
 Profit Center No. 3 /  
 Project Manager 4 Tom Mulder  
 Purchase Order No. 6 181760 OP  
 Required Report Date 11 10/30/01

Samples Shipment Date 7 10/25/01  
 Lab Destination 8 Atmaa  
 Lab Contact 9 Mike Porter  
 Project Contact/Phone 12 Tom Mulder 619-533-7302  
 Carrier/Waybill No. 13 FedEx

Bill to: 5 IT Corp  
San Diego  
 Report to: 10 IT Corp  
1230 Columbia St. Ste 1200  
San Diego CA 92101  
fax 619-239-1238

## ONE CONTAINER PER LINE

Sample Number <sup>14</sup>	Sample Description/Type <sup>15</sup>	Date/Time Collected <sup>16</sup>	Container Type <sup>17</sup>	Sample Volume <sup>18</sup>	Pre-servative <sup>19</sup>	Requested Testing Program <sup>20</sup>	Condition on Receipt <sup>21</sup>	Disposal Record No. <sup>22</sup>
1-2 s	Air	10/25/01 0650	1L Tedlar bag		Dark	CH <sub>4</sub> , H <sub>2</sub> S, CO <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> NMOC's		Lab - 1
1-14 d		10/25/01 0730						199-2
1-21 s		10/25/01 0655						3
1-28 s		10/25/01 0710						4
1-24 d		10/25/01 0725						5

FOR LAB  
USE ONLY

FOR LAB  
USE ONLY

Yellow: Field copy

\* See back of form for special instructions.

Special Instructions: <sup>23</sup>

Possible Hazard Identification: <sup>24</sup>

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: <sup>25</sup>

Return to Client ☐ Disposal by Lab ☒ Archive \_\_\_\_\_ (mos.)

Turnaround Time Required: <sup>26</sup>

Normal ☐ Rush ☒

QC Level: <sup>27</sup>

I. ☐ II. ☐ III. ☐

Project Specific (specify): \_\_\_\_\_

1. Relinquished by <sup>28</sup> Juan Ceniga  
 (Signature/Affiliation)

Date: 10/25/01  
 Time: 1500

1. Received by <sup>28</sup>  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

2. Relinquished by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

2. Received by  
 (Signature/Affiliation)

Date: 10/26/01  
 Time: 1000

3. Relinquished by  
 (Signature/Affiliation)

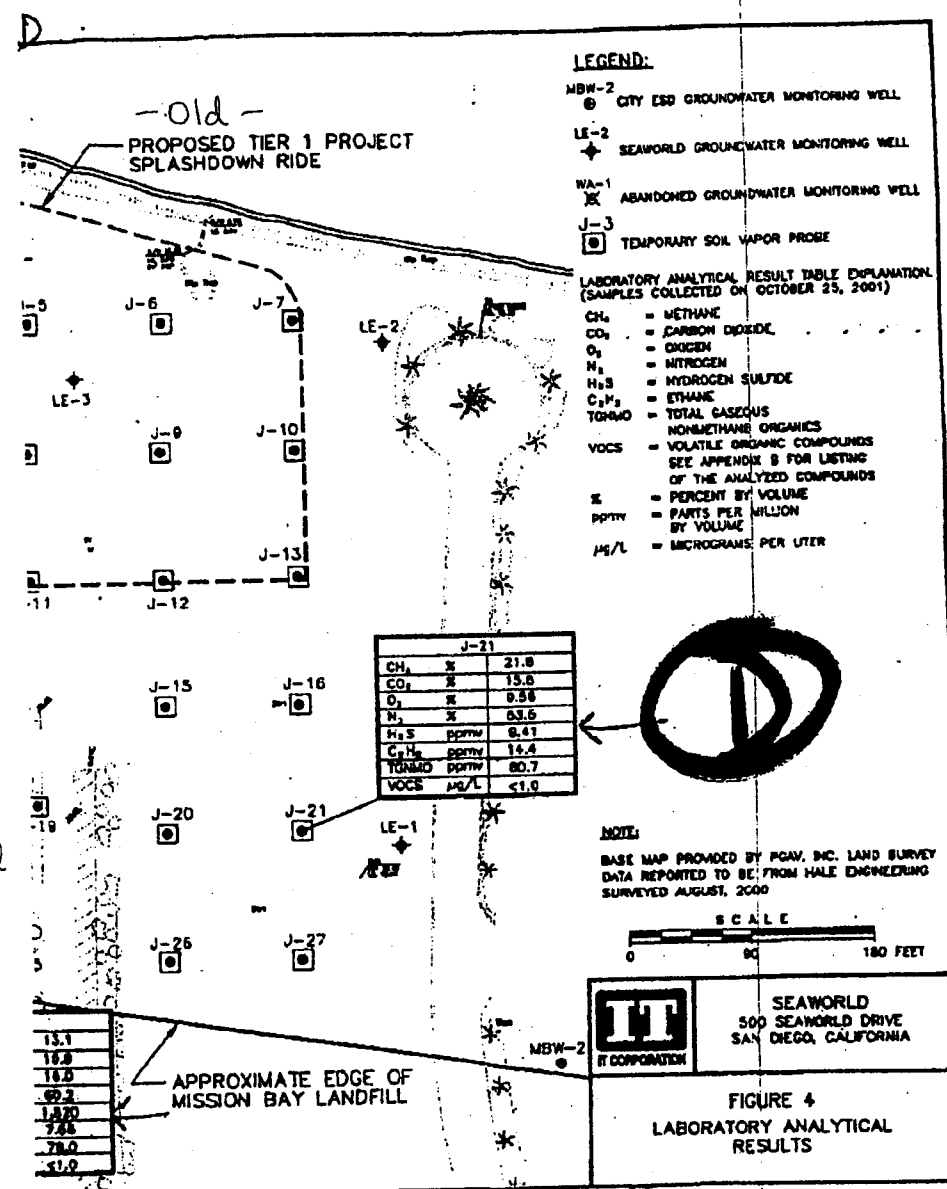
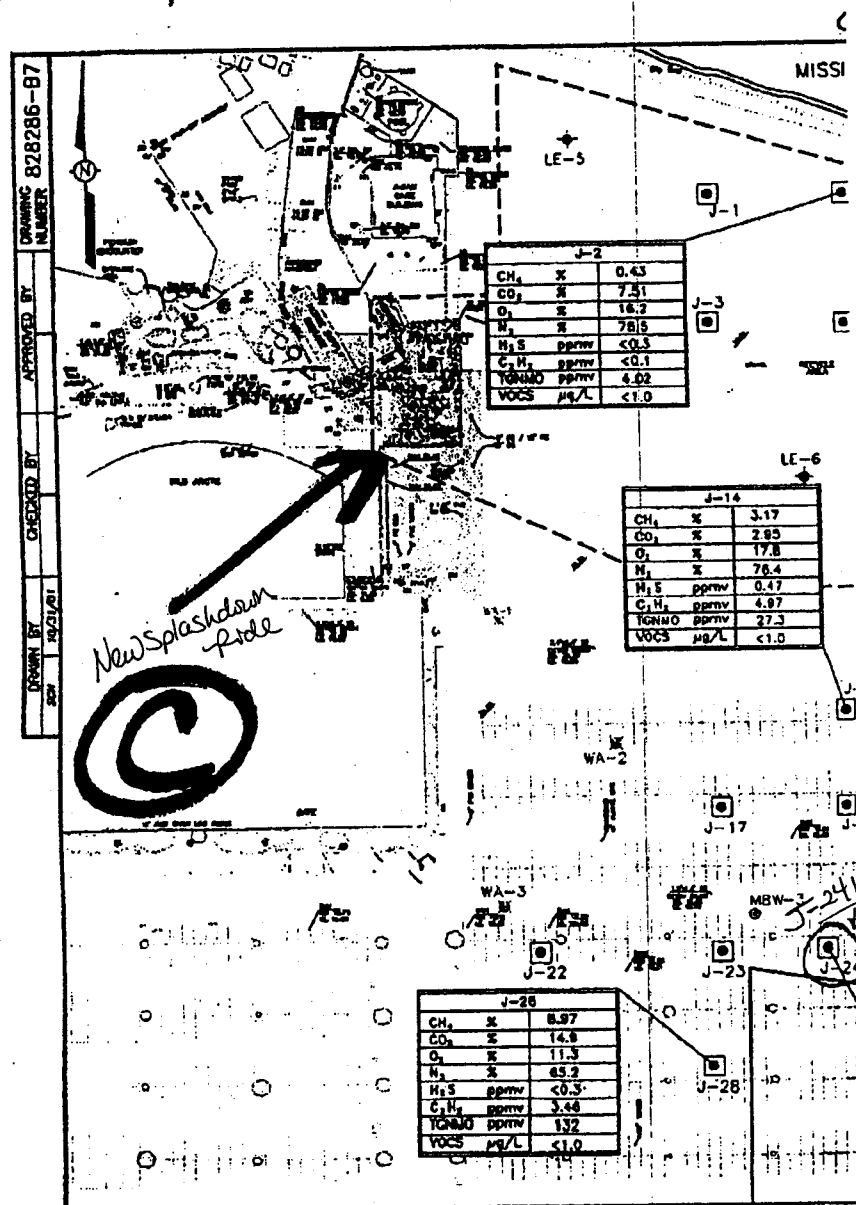
Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

3. Received by  
 (Signature/Affiliation)

Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Comments: <sup>29</sup>

**EXHIBIT B**





**EXHIBIT C**

W351

**New tests slated for gas that hit 8 park builders | Decomposing trash believed likely source**

*The San Diego Union - Tribune; San Diego, Calif.; Oct 9, 1988; John Wilkens;*

**Sub Title:** [UNION, 1,2 Edition]

**Start Page:** B-3

**Personal Names:** Stephany, Gary

**Abstract:**

*Gary Stephany, director of county Environmental Health Services, said yesterday that eight workers reported being stricken by gas that smelled of rotten eggs Wednesday and Thursday at the 109-acre South Shores Park. The park is being built just east of Sea World over an old city dump.*

*Stephany said the source of the fumes had not been found, but officials said they were fairly certain that an earth mover hit a pocket of underground hydrogen sulfide gas created by decomposing trash.*

*County health workers tested the site Thursday but found no gas, Stephany said. This is one reason that they suspect a pocket of fumes was released. The gas never posed a danger to Sea World or other adjacent areas, Stephany said.*

**Full Text:**

*Copyright SAN DIEGO UNION TRIBUNE PUBLISHING COMPANY Oct 9, 1988*

Additional tests are scheduled tomorrow to determine the source of fumes that sickened construction workers and halted grading last week at a city park being built in Mission Bay.

Gary Stephany, director of county Environmental Health Services, said yesterday that eight workers reported being stricken by gas that smelled of rotten eggs Wednesday and Thursday at the 109-acre South Shores Park. The park is being built just east of Sea World over an old city dump.

Three workers began suffering from vomiting, diarrhea and headaches and were taken to a hospital, where they were treated and released, Stephany said. The other five were less seriously affected and went home.

Stephany said the source of the fumes had not been found, but officials said they were fairly certain that an earth mover hit a pocket of underground hydrogen sulfide gas created by decomposing trash.

The rotten-egg smell is consistent with hydrogen sulfide gas, and is not unusual at an old landfill, Stephany said.

County health workers tested the site Thursday but found no gas, Stephany said. This is one reason that they suspect a pocket of fumes was released. The gas never posed a danger to Sea World or other adjacent areas, Stephany said.

Work at the site has been halted until tests are made by an engineering consultant tomorrow, he said. County officials may require revisions to the project's safety plan, depending on what the tests show.

Stephany said the existing safety plan calls for the workers to wear respirators because of possible hazards from the landfill and because of dust kicked up by the graders.

The workers stricken last week apparently had removed their masks temporarily, he said.

The plan also required the contractors, T.B. Penick & Sons Inc., to notify a safety officer and the county if and when such a gas was discovered, Stephany said, but that was not done. Instead, the county learned about the incident from the hospital where the workers were treated, he said.

Officials from the construction company and the city, which is overseeing the project, could not be reached for comment yesterday.

Grading began last month on the park's \$4.5 million first phase, which will include a nine-acre lagoon, a 10-lane boat-launching ramp, a boat dock, a 265-space parking lot and picnic areas.

A second phase, costing about \$8 million, will include grassy play areas, additional parking and restrooms. The park also will feature bike paths and playgrounds.

---

Reproduced with permission of the copyright owner. Further reproduction or distribution is prohibited without permission.

W352

## **Project halted at Mission Bay as fumes hit workers**

*The San Diego Union - Tribune; San Diego, Calif.; Oct 8, 1988; Michael Richmond;*

**Sub Title:** [TRIBUNE, 1,2 Edition]

**Start Page:** B-1

**Personal Names:** Leppert, John  
Stephany, Gary  
Johnston, Jeff

### **Abstract:**

*Work on a \$4.5 million project in Mission Bay Park was halted this week after construction workers were stricken by gas fumes from an old city dump on the site.*

*A county Health Services Department official, Gary Stephany, said yesterday that eight workers went home sick as a result of exposure to the fumes. Jeff Johnston, project manager for the contractor, had said earlier that five workers became sick, were treated and were released from an emergency clinic the same day.*

*Johnston and Stephany, director of Environmental Health Services, speculated that the fumes were from hydrogen sulfide gas, a natural product of decomposing trash. The fumes apparently escaped when grading equipment uncovered buried trash, Stephany said.*

### **Full Text:**

*Copyright SAN DIEGO UNION TRIBUNE PUBLISHING COMPANY Oct 8, 1988*

Work on a \$4.5 million project in Mission Bay Park was halted this week after construction workers were stricken by gas fumes from an old city dump on the site.

"Some of the workers complained of dizziness, headaches, sore throats, and some actually were throwing up," said John Leppert, an assistant to the city manager.

Leppert is overseeing the project.

The men were stricken Wednesday, and the contractor, T.B. Penick & Sons Inc., stopped work Thursday, Leppert said.

The workers were operating bulldozers grading the new 109-acre South Shores Park just east of Sea World and north of Sea World Drive.

A county Health Services Department official, Gary Stephany, said yesterday that eight workers went home sick as a result of exposure to the fumes. Jeff Johnston, project manager for the contractor, had said earlier that five workers became sick, were treated and were released from an emergency clinic the same day.

Johnston and Stephany, director of Environmental Health Services, speculated that the fumes were from hydrogen sulfide gas, a natural product of decomposing trash. The fumes apparently escaped when grading equipment uncovered buried trash, Stephany said.

Workers described the accompanying odor as "a terrible, terrible rotten-egg smell," Johnston said.

"We asked them to get checked out by a physician to make sure there were no permanent effects,"

Johnston said.

He said the city is considering abandoning some of the grading because of the gas problem.

Health department personnel tested for gases at the landfill Thursday but found no evidence of any, Stephany said. Additional testing is planned Monday by engineering consultants hired by the city.

Stephany said neither the city nor the contractor notified his department of the gas problem as required. He said the department was informed by Sharp Memorial Hospital, where some of the workers had gone for examinations.

Leppert said some workers began wearing respirators Thursday before the contractor decided to halt work until the problem was resolved.

The site is on land leading to a nine-acre lagoon cut into Mission Bay as part of the construction, Leppert said.

"There is no problem in the lagoon area," he said, adding that the fumes came from a point east of the lagoon.

Leppert said officials hope construction can resume Monday elsewhere in the project.

The project includes a 10-lane boat-launching ramp, a boat dock, a parking lot, an access road, restrooms and picnic areas.

The first phase, which began last month, is to cost some \$4.5 million. The second phase, which will include additional restrooms, more parking space and grassy play areas, is estimated to cost \$8 million.

City officials said concern over health problems resulting from the old landfill first arose about four years ago when a hotel was planned at the site. Test borings then found no hazardous materials, Stephany said, but evidence of methane gas was found.

The hotel project "is in a state of limbo," said Martin Breslauer, assistant director of the city Property Department.

---

Reproduced with permission of the copyright owner. Further reproduction or distribution is prohibited without permission.

15-100  
C085

RECEIVED

OFFICE OF

THE CITY ATTORNEY

MAY 29 11 16 AM '90

CITY OF SAN DIEGO

JOHN W. WITT  
CITY ATTORNEY

ENVIRONMENTAL  
HEALTH SERVICES

CURTIS M. FITZPATRICK  
ASSISTANT CITY ATTORNEY  
RONALD L. JOHNSON  
ASSISTANT CITY ATTORNEY  
C. ALAN SUMPTION  
CHIEF DEPUTY CITY ATTORNEY  
EUGENE P. GORDON  
CHIEF DEPUTY CITY ATTORNEY

LITIGATION DIVISION  
525 "B" STREET, SUITE 2100  
SAN DIEGO, CALIFORNIA 92101  
(619) 533-4700  
FAX (619) 533-4747

May 23, 1990

H 86426  
TB 59-D2  
See World Dr

Barbara Pyson  
Department of Health Services  
EHS/HMMD  
P. O. Box 85261  
San Diego, CA 92138-5261

Dear Ms. Pyson:

Elizabeth Carter, Administrator of the Estate of Harrison Carter  
v. City of San Diego, et al.

I am a Deputy City Attorney for the City of San Diego. I am investigating a gas leak that allegedly occurred at the Mission Bay Landfill on October 6, 1988. Nick Vent, the investigator who investigated the incident, told me a letter would be required for the release of the County records. I would like a copy of the County's complete file including photographs on this incident. I have included a copy of Hazardous Material Incident Report #5016 (HIRT 88-478) which may help you locate this file. If there is a charge for the records, please bill me.

If you have any questions concerning this request, please call me at 533-4794.

Sincerely yours,

JOHN W. WITT, City Attorney

By *Deborah A. Hollingsworth*  
Deborah A. Hollingsworth  
Deputy City Attorney

DAH:eh:Lit.  
Enclosure

6/8 left msg  
is mrm 6/11 @ 8AM  
OK

CASE # 615-395 8/22/89

HMMD USE ONLY

Request #

3-46

## REQUEST TO REVIEW HMMD RECORDS

## SUBMIT TO:

County of San Diego  
Department of Health Services  
Environmental Health Services  
Hazardous Materials Management Division  
P.O. Box 85261  
San Diego, CA 92138-5261  
(619) 338-2222

CASE

(You may attach business card/overprint with business card if preferred.)

REQUESTED BY:

COMPANY NAME:

MAIL ADDRESS:

CONTACT PERSON:

PHONE:

CITY OF SAN DIEGO - CITY ATTY'S OFFICE  
525 B St, Suite 2100  
San Diego, CA 92101  
Nancy Donnelly  
(619) 533-4765

C161  
3/14/90 - After per  
files - please not  
incomplete bef  
proceeding.  
M. K. Kelle

A request is hereby made to review Hazardous Materials Management Division (HMMD) records, as indicated below for the following reason: Wrongful death litigation  
Heavy equipment operator died as a result of fumes per Elizabeth Carter

Telephone Request TAKEN By Marianne Rucke Investigator

3/13/90

Signature

Title

Date

A separate form must be completed for each file/address requested.

Establishment Name Mission Bay Shores Project Address/City South Fumes Zip Code 10/88 File # (optional) 86426  
TYPE OF INFORMATION REQUESTED (Check as many as apply)  
☒ Landfill ☐ Routine Inspection ☐ Tank Removal ☐ Tank Installation ☐ Tank Leak ☒ Emergency ☒ Complaint  
Permit File ☐ Unauthorized Release ☐ Response ☐ SEWO

HMMD USE ONLY BELOW THIS LINE

H#	AT#	NT#	T#	HIRT#	#
Files pulled by/date:				88-478	017
Conf. Info. to Cover?	YES NO	YES NO	YES NO	YES NO	YES NO
Checked by/date:					
Confidential Info covered by/date:	N/A C.K. 3/16			N/A C.K. 3/16	N/A C.K. 3/16

Date all files ready: 3/16 Requester notified by: Crystal Date: 3/16 Time: 9:10

2nd notification by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ 3rd notification: \_\_\_\_\_

Review Scheduled: Friday Date: 3/16 Time: 1:30 Rescheduled/Date: \_\_\_\_\_ Time: \_\_\_\_\_

Files reviewed by: Nancy Donnelly of City Atty's office Date: 3/16/90

☐ A review of records has been conducted and HMMD finds no record.

Signature \_\_\_\_\_  
DHS:HM-9098 (3/90)

Title \_\_\_\_\_ Date \_\_\_\_\_



NANCY DONNELLY  
LITIGATION INVESTIGATOR

AREA 619  
533-4765

OFFICE OF CITY ATTORNEY  
LITIGATION DIVISION  
525 "B" STREET, SUITE 2000  
SAN DIEGO, CALIFORNIA 92101



**EXHIBIT D**

## **SWAPE LLC**

Soil Water Air Protection Enterprise  
201 Wilshire Boulevard, Second Floor  
Santa Monica California 90401

---

July 21, 2003

**To: California Earth Corps**

Don May  
4927 Minturn Avenue  
Lakewood, California 90712

**Re: Hydrogen Sulfide and Methane at Mission Bay Landfill**

Dear Mr. May:

My name is Paul Rosenfeld and I work for SWAPE LLC. I have a Ph.D. in Soil Chemistry from the University of Washington in Seattle, Washington. I am now an Adjunct Professor at the University of California, Los Angeles, teaching courses in Environmental Health Science. I have conducted human health risk assessments for various properties contaminated with a variety of contaminants including pesticides, polychlorinated biphenols, volatile organic compounds, semi-volatile organic compounds, and heavy metals. I have taught courses with the California Integrated Waste Management Board on alternative landfill cover design and I have worked at several different landfill facilities. I have also worked for the United States Navy Base Realignment and Closure (BRAC) Program and spent much of my time investigating contaminated buried material.

I have reviewed several articles discussing the contaminants at the Mission Bay Landfill and recognize that there are high methane and hydrogen sulfide concentrations in the subsurface soils that pose a threat to human health and the environment. The proposed ride "Voyage To Atlantis" also referred to as "Splash Down Thrill Ride" will be located very close to extremely high concentrations of hydrogen sulfide and methane that pose an immediate high risk to human health and the environment.

IT Corporation (2002) reported that vapor probe J-24 had a hydrogen sulfide concentration of 1820 ppmv. This location is approximately 315 feet away from the entrance of the proposed ride. On December 20 and 23, 1996 wells LE-1, LE-2 and LE-3 were drilled and installed in the lease expansion area. During the drilling LE-4, on December 23, hydrogen sulfide gas was detected at concentrations as high as 9 ppm and methane was detected at a maximum of 1,000 ppm (Flour Daniel GTI, 1997).

The National Institute of Occupational Safety and Health (NIOSH) permissible exposure limit (PEL) for hydrogen sulfide is 10 ppm and the concentration considered immediately dangerous to life and health (IDLH) for hydrogen sulfide is 100 ppm (NIOSH/OSHA 1981). The Office of Environmental Health Hazard Assessment (OEHHA) reference exposure level (REL) for hydrogen sulfide is 0.03 ppm. The REL are established at exposure levels that would not produce any adverse health effect. **Hence vapor probe J-24 has a hydrogen sulfide concentration 18 times the IDLH concentration; and exposure to this gas can result in immediate death.**

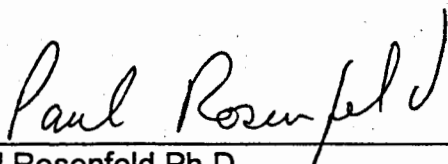
At high concentrations, hydrogen sulfide can paralyze the olfactory senses (NIOSH 1979). Note that the hydrogen sulfide odor TLV is lower than the OEHHA REL. Hydrogen sulfide is a severe eye irritant and may cause tissue damage (NIOSH/OSHA 1981). At low concentrations, gas can cause dizziness, headache, nausea, and irritation of the respiratory tract. At high concentrations, hydrogen sulfide can cause unconsciousness, respiratory failure, and death within minutes. In addition, hydrogen sulfide may be explosive at a wide range of concentrations in air from 4.3% to 46% by volume (NIOSH 1985a). Both methane and hydrogen sulfide are explosive gasses that form under anaerobic conditions when there is an absence of oxygen. The lower explosive limit of methane is 5% by volume (IT Corporation 2002).

**Currently all that separates the public from this harmful gas is a layer of fill and asphalt, which may be breached of the landfill settlement, liquefaction and/or an earthquake.** Landfills settle as organic waste decomposes over time. Much of the landfill is now covered by a Sea World parking lot with asphalt. The asphalt currently has cracks and will continue to crack. Because the asphalt has cracks, it is not air tight. The site conditions near the proposed ride are unsafe because the cap on the landfill does not have a protective barrier (e.g. polyethylene with a geocomposite textile for vapor recovery) to control gas releases. The entire site is constructed on unconsolidated landfill material and during an earthquake it is possible that a deadly hydrogen sulfide release may occur. The site is susceptible to liquefaction, according to Christian Wheeler Engineering (2002). Christian Wheeler Engineering (2002) noted that "Our analysis indicates that the potential for up to approximately 10 to 11.5 inches of seismically -induced, total settlement may be expected at the site, in its present condition, as a result of soil liquefaction caused by a 6.9 magnitude seismic event..." Hence, one can assume that lesser earthquakes will result in significant settling that will likely cause preferential pathways for release of hydrogen sulfide into the air, threatening the public and the environment.

IT Corporation (2002) recommended "If structures are built near the landfill, in the future, then the design may need to incorporate gas migration measures, such as active gas control measures (e.g., gas extraction wells) or passive gas control measures (e.g., cutoff trenches, slurry walls and vent trenches)." IT Corporation

Corporation went on to recommend "If the landfill and surrounding land is paved with materials that are impermeable to landfill gas, then there is potential to increase the effective seal of ground surface. This could result in increased concentrations of landfill gas accumulating within soil vapor." Hence, landfill settling, an earthquake, or liquefaction will likely create a pathway resulting in a hydrogen sulfide vapor release that will threaten human health and the environment.

Respectfully,



Paul Rosenfeld Ph.D.  
SWAPE LLC

#### REFERENCES:

Christian Wheeler (2002) "Report of Preliminary Geotechnical Investigation, Sea World Atlantis Project San Diego California." May 31.

Flour Daniel GTI (1996) ": Assessment Report Sea World Lease Expansion 1720 South Shores Road, San Diego California," Project Number 023450021. June 9th.

NIOSH [1979]. Criteria for a recommended standard: working in confined spaces. Morgantown, WV: U.S. Department of Health, Education, and Welfare, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHEW (NIOSH) Publication No. 80-106.

NIOSH [1985a]. NIOSH pocket guide to chemical hazards. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS [NIOSH] Publication No. 85-114.

NIOSH/OSHA [1981]. Occupational health guidelines for chemical hazards. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication.

IT Corporation (2002) Results of Soil Vapor Assessment Seaworld Expansion Plan, 16-Acre Tract. Project Number 830418.

**EXHIBIT E**

## CALIFORNIA COASTAL COMMISSION

SAN DIEGO AREA  
7575 METROPOLITAN DRIVE, SUITE 103  
SAN DIEGO, CA 92108-4402  
(619) 767-2370



## APPLICATION FOR COASTAL DEVELOPMENT PERMIT

## SECTION I. APPLICANT

1. Name, mailing address, and telephone number of all applicants.

SeaWorld Adventure Park

500 SeaWorld Drive

San Diego, CA 92109

619-226-3628 fax 619-226-3999

(Area code/daytime phone number) (Fax number)

Note: All applicants for the development must complete Appendix A, the declaration of campaign contributions.

2. Name, mailing address and telephone number of applicant's representatives, if any. Please include all representatives who will communicate on behalf of the applicant or the applicant's business partners, for compensation, with the Commission or the staff. (It is the applicant's responsibility to update this list, as appropriate, including after the application is accepted for filing. Failure to provide this information prior to communication with the Commission or staff may result in denial of the permit or criminal penalties.)

Patrick Owen, VP Design & Engineering

SeaWorld Adventure Park

500 SeaWorld Drive

San Diego, CA 92109

619-226-3628 fax 619-226-3999

(Area code/daytime phone number) (Fax number)

## SECTION II. PROPOSED DEVELOPMENT

Please answer all questions. Where questions do not apply to your project (for instance, project height for a land division), indicate Not Applicable or N.A..

1. **Project Location.** Include street address, city, and/or county. If there is no street address, include other description such as nearest cross streets.

500 SeaWorld Drive

number street

San Diego Sn Diego

city county

Assessor's Parcel Number(s) (obtainable from tax bill or County Assessor): 760-037-001

FOR OFFICE USE ONLY

6-01-129

APPLICATION NUMBER

RECEIVED

FILED

FEE

DATE PAID

8/8/01

2000-

8/8/01

6. Gross floor area excluding parking (sq.ft.) 24036 ft. sq.

Gross floor area including covered parking and accessory buildings (sq.ft.) 24036 sq. ft.

7. Lot area (within property lines) (sq.ft. or acre) 189.3 ac.

Lot coverage	Existing (sq.ft. or acre)	New proposed (sq.ft. or acre)	Total (sq.ft. or acre)
Building	12.544	0.552	13.096
Paved area	100.08	2.238	102.318
Landscaped area	43.176	2.710	45.886
Unimproved area	16.500	-5.500	11.000
Water	17.000	0.000	17.000
Grand Total (should equal lot area as shown in #7 above)			189.300

8. Is any grading proposed?..... ☒ Yes ☐ No

*If yes, complete the following.*

a) Amount of cut	17536 cu. yds.	d) Maximum height of cut slope	7.0 ft.
b) Amount of fill	17536 cu. yds.	e) Maximum height of fill slope	7.0 ft.
c) Amount of import or export (circle which)	0.0 cu. yds.	f) Location of borrow or disposal site	on site

Grading and drainage plans must be included with this application. In certain areas, an engineering geology report must also be included. See Section IV, paragraph 11 for the specifics of these requirements.

Please list any geologic or other technical reports of which you are aware that apply to this property

Report of Preliminary Geotechnical Investigation  
SeaWorld Atlantis Project Dated October 16, 20  
Christian Wheeler Engineering

9. Parking:

*Number of parking spaces (indicate whether standard or compact)*

Existing spaces	Proposed new spaces	Net number of spaces on completion of project
8350	0	8350

Is any existing parking being removed?..... ☒ Yes ☒ No

If yes, how many spaces? ~~120~~ 120 size ~~10'x18'~~ 10'x18' (CAR)

3. Has any application for development on this site including any subdivision been submitted previously to the California Coastal Zone Conservation Commission or the Coastal Commission? ..... ☒ Yes ☐ No

If yes, state previous application number(s) Numerous over the last 25 years

4. Is the development between the first public road and the sea (including lagoons, bays, and other bodies of water connected to the sea) ..... ☒ Yes ☐ No

If yes, is public access to the shoreline and along the coast currently available on the site or near the site? ..... ☒ Yes ☐ No

If yes, indicate the location and nature of the access, including the distance from the project site, if applicable.

Mission Bay adjacent to SeaWorld Adventure Park

5. Does the development involve diking, filling, draining, dredging or placing structures in open coastal waters, wetlands, estuaries, or lakes? (Please check yes or no)

a) diking      b) filling      c) dredging      d) placement of structures

☐ Yes      ☐ Yes      ☐ Yes      ☐ Yes

☒ No      ☒ No      ☒ No      ☒ No

Amount of material to be dredged or filled (indicate which) N/A cu. yds.

Location of dredged material disposal site N/A

Has a U.S. Army Corps of Engineers' permit been applied for? ..... ☐ Yes ☒ No

6. Will the development extend onto or adjoin any beach, tidelands, submerged lands or public trust lands? ..... ☐ Yes ☒ No

For projects on State-owned lands, additional information may be required as set forth in Section IV, paragraph 10.

7. Will the development protect existing lower-cost visitor and recreational facilities? ..... ☐ Yes ☒ No

Will the development provide public or private recreational opportunities? ..... ☒ Yes ☐ No

If yes, explain.

SeaWorld provides passive recreation



2. Assessor's parcel map(s) showing the page number, the applicant's property, and all other properties within 100 feet (excluding roads) of the property lines of the project site. (Available from the County Assessor.)
3. Copies of required local approvals for the proposed project, including zoning variances, use permits, etc., as noted on Local Agency Review Form, Appendix B. Appendix B must be completed and signed by the local government in whose jurisdiction the project site is located.
4. Stamped envelopes addressed to each property owner and occupant of property situated within 100 feet of the property lines of the project site (excluding roads), along with a list containing the names, addresses and assessor's parcel numbers of same. The envelopes must be plain (i.e., no return address), and regular business size (9 1/2" x 4 1/8"). Include first class postage on each one. **Metered postage is not acceptable.** Use Appendix C, attached, for the listing of names and addresses. (Alternate notice provisions may be employed at the discretion of the District Director under extraordinary circumstances.)
5. Stamped, addressed envelopes (no metered postage, please) and a list of names and addresses of all other parties known to the applicant to be interested in the proposed development (such as persons expressing interest at a local government hearing, etc.).
6. A vicinity or location map (copy of Thomas Bros. or other road map or USGS quad map) with the project site clearly marked.
7. Copy(s) of project plans, drawn to scale, including site plans, floor plans, elevations, grading and drainage plans, landscape plans, and septic system plans. Trees to be removed must be marked on the site plan. In addition, a reduced site plan, 8 1/2" x 11" in size, must be submitted. Reduced copies of complete project plans will be required for large projects. NOTE: See Instruction page for number of sets of plans required.
8. Where septic systems are proposed, evidence of County approval or Regional Water Quality Control Board approval. Where water wells are proposed, evidence of County review and approval.
9. A copy of any Draft or Final Negative Declaration, Environmental Impact Report (EIR) or Environmental Impact Statement (EIS) prepared for the project. If available, comments of all reviewing agencies and responses to comments must be included.
10. Verification of all other permits, permissions or approvals applied for or granted by public agencies (e.g., Department of Fish and Game, State Lands Commission, U.S. Army Corps of Engineers, U.S. Coast Guard). For projects such as seawalls located on or near state tidelands or public trust lands, the Coastal Commission must have a written determination from the State Lands Commission whether the project would encroach onto such lands and, if so, whether the State Lands Commission has approved such encroachment. See memo to "Applicants for shoreline development" dated December 13, 1993.
11. For development on a bluff face, bluff top, or in any area of high geologic risk, a comprehensive, site-specific geology and soils report (including maps) prepared in accordance with the Coastal Commission's Interpretive Guidelines. Copies of the guidelines are available from the District Office.

## SECTION V. NOTICE TO APPLICANTS

Under certain circumstances, additional material may be required prior to issuance of a coastal development permit. For example, where offers of access or open space dedication are required, preliminary title reports,

# APPLICATION FOR COASTAL DEVELOPMENT PERMIT

## APPENDIX A

### DECLARATION OF CAMPAIGN CONTRIBUTIONS

Government Code Section 84308 prohibits any Commissioner from voting on a project if he or she has received campaign contributions in excess of \$250 within the past year from project proponents or opponents, their agents, employees or family, or any person with a financial interest in the project.

In the event of such contributions, a Commissioner must disqualify himself or herself from voting on the project.

Each applicant must declare below whether any such contributions have been made to any of the listed Commissioners or Alternates (see last page).

CHECK ONE

☒

The applicants, their agents, employees, family and/or any person with a financial interest in the project have **not** contributed over \$250 to any Commissioner(s) or Alternate(s) within the past year.

☐

The applicants, their agents, employees, family, and/or any person with a financial interest in the project have **contributed** over \$250 to the Commissioner(s) or Alternate(s) listed below within the past year.

Commissioner or Alternate \_\_\_\_\_

Commissioner or Alternate \_\_\_\_\_

Commissioner or Alternate \_\_\_\_\_

  
\_\_\_\_\_  
Signature of Applicant or Authorized Agent

July 30, 2001

\_\_\_\_\_  
Date

Please print your name Patrick Owen, VP Design & Engineering, SeaWorld

# APPLICATION FOR COASTAL DEVELOPMENT PERMIT

## APPENDIX B

### LOCAL AGENCY REVIEW FORM

#### SECTION A (TO BE COMPLETED BY APPLICANT)

Applicant SeaWorld Adventure Park

Project Description SeaWorld's 2003 Expansion Project

Location 500 SeaWorld Drive, San Diego, CA

Assessor's Parcel Number 760-037-01-01

#### SECTION B (TO BE COMPLETED BY LOCAL PLANNING OR BUILDING INSPECTION DEPARTMENT)

Zoning Designation N/A du/ac

General or Community Plan Designation SEAWORLD MASTER PLAN UPDATE du/ac

#### Local Discretionary Approvals

☒ Proposed development meets all zoning requirements and needs no local permits other than building permits.

☐ Proposed development needs local discretionary approvals noted below.

Needed Received

- |                                     |                          |   |
|-------------------------------------|--------------------------|---|
| <input type="checkbox"/>            | <input type="checkbox"/> | Design/Architectural review                         |
| <input type="checkbox"/>            | <input type="checkbox"/> | Variance for _____                                  |
| <input type="checkbox"/>            | <input type="checkbox"/> | Rezone from _____                                   |
| <input type="checkbox"/>            | <input type="checkbox"/> | Tentative Subdivision/Parcel Map No. _____          |
| <input type="checkbox"/>            | <input type="checkbox"/> | Grading/Land Development Permit No. _____           |
| <input type="checkbox"/>            | <input type="checkbox"/> | Planned Residential/Commercial Development Approval |
| <input type="checkbox"/>            | <input type="checkbox"/> | Site Plan Review                                    |
| <input type="checkbox"/>            | <input type="checkbox"/> | Condominium Conversion Permit                       |
| <input type="checkbox"/>            | <input type="checkbox"/> | Conditional, Special, or Major Use Permit No. _____ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Other   |

The proposed development is subject to California Coastal Commission certification of the SeaWorld Master Plan Update, which was approved by the Council of the City of San Diego on July 10, 2001. The SeaWorld Master Plan update contains specific design guidelines for this project.

#### CEQA Status

- ☐ Categorically Exempt Class \_\_\_\_\_ Item \_\_\_\_\_
- ☐ Negative Declaration Granted (Date) \_\_\_\_\_
- ☒ Environmental Impact Report Required, Final Report Certified (Date) 7-10-01  
(LDR No. 99-0618)
- ☐ Other \_\_\_\_\_

Prepared for the City/County of SAN DIEGO by Annex Lowmy  
Date 7-30-01 Title Senior Planner

Application No. \_\_\_\_\_

## APPLICATION FOR COASTAL DEVELOPMENT PERMIT

### APPENDIX C

LIST OF PROPERTY OWNERS AND OCCUPANTS WITHIN 100 FEET AND THEIR ADDRESSES  
(MAKE ADDITIONAL COPIES OF THIS SHEET AS NECESSARY)

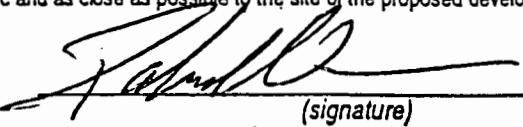
NONE ADJACENT		

## APPENDIX D

### DECLARATION OF POSTING

Prior to or at the time the application is submitted for filing, the applicant must post, at a conspicuous place, easily read by the public and as close as possible to the site of the proposed development, notice that an application for the proposed development has been submitted to the Commission. Such notice shall contain a general description of the nature of the proposed development. The Commission furnishes the applicant with a standardized form to be used for such posting. If the applicant fails to post the completed notice form and sign the Declaration of Posting, the Executive Director of the Commission shall refuse to file the application, or shall withdraw the application from filing if it has already been filed when he or she learns of such failure. 14 Cal. Admin. Code Section 13054(b).

Please sign and date this Declaration of Posting form when the site is posted; it serves as proof of posting. It should be returned to our office with the application.

Pursuant to the requirements of California Administrative Code Section 13054(b), I hereby certify	
that on <u>July 30, 2001</u>	I or my authorized representative posted the Notice
<small>(date of posting)</small>	
of Pending Permit for application to obtain a coastal development permit for the development of	
<u>SeaWorld's 2003 Expansion Project</u>	
<small>(description of development)</small>	
Located at <u>500 SeaWorld Drive, San Diego, CA 92109</u>	
<small>(address of development or assessor's parcel number)</small>	
The public notice was posted at <u>SeaWorld Adventure Park</u>	
<small>(a conspicuous place, easily seen by the public and as close as possible to the site of the proposed development)</small>	
	
<small>(signature)</small>	
<u>July 30, 2001</u>	
<small>(date)</small>	

NOTE: Your application cannot be processed until this Declaration of Posting is signed and returned to this office.

FOR OFFICE USE ONLY	
PERMIT NUMBER	<u>6-01-129</u>
RECEIVED	<u>8/8/01</u>
DECLARATION COMPLETE	<u></u>

## APPENDIX E

### PERMIT APPLICATION FEE SCHEDULE

EFFECTIVE JANUARY 1, 1998, ALL PERMIT APPLICATION FEES ARE DEPOSITED IN THE COASTAL ACCESS ACCOUNT OF THE STATE COASTAL CONSERVANCY FUND. MONIES IN THE ACCOUNT ARE AVAILABLE TO PUBLIC AGENCIES AND OTHER ORGANIZATIONS FOR THE DEVELOPMENT, MAINTENANCE, AND OPERATION OF PUBLIC SHORELINE ACCESS FACILITIES (PUBLIC RESOURCES CODE SECTION 30620(c)(2)).

#### I. RESIDENTIAL PROJECTS

##### A. New single-family dwellings

De minimis waiver.....	<input type="checkbox"/>	\$ 200
Administrative permit .....	<input type="checkbox"/>	\$ 200 <sup>1</sup>
Regular calendar.....		
If 1,500 or less square feet <sup>2</sup> .....	<input type="checkbox"/>	\$ 250 <sup>3</sup>
If 1,501 to 5,000 square feet <sup>2</sup> .....	<input type="checkbox"/>	\$ 500 <sup>3</sup>
If 5,001 or more square feet <sup>2</sup> .....	<input type="checkbox"/>	\$ 1,000 <sup>3</sup>

##### B. Additions or improvements to single-family dwellings

De minimis waiver.....	<input type="checkbox"/>	\$ 200
------------------------	--------------------------	--------

If handled as an amendment to a previous coastal development permit, see Amendments (Section III.D.) below.

If not a waiver or an amendment to a previous coastal development permit, the fee is assessed according to the schedule in A. above (i.e., based on the calendar and/or size of the addition, plus the grading fee, if applicable).

##### C. Multiple residential projects (including residential subdivisions, resubdivisions and condominium conversions) <sup>4</sup>

2-4 units.....	<input type="checkbox"/>	\$ 600 <sup>3</sup>
5-16 units.....	<input type="checkbox"/>	\$ 2,000 <sup>3</sup>
17-166 units.....	<input type="checkbox"/>	\$ 120 /unit <sup>3</sup>
167 units or more.....	<input type="checkbox"/>	\$ 20,000 <sup>3</sup>

<sup>1</sup> Fee changes if removed from the Administrative Calendar and rescheduled on the Regular Calendar. Additional fee amount must be paid before item is scheduled for hearing on the Regular Calendar.

<sup>2</sup> Including gross internal floor space of main house, attached garage(s), covered patios, plus any detached structures intended for human habitation (e.g., guest houses, detached bedrooms, in-law units); not including patios or decks open to the sky, detached garages, barns, art studios, tool sheds, and other outbuildings not primarily intended for human habitation.

<sup>3</sup> Grading fee applies; see Item F.

<sup>4</sup> If land division and construction of residences are proposed together, the fee is based solely upon the construction of residences.

D. Extensions <sup>7</sup> and Reconsiderations

Single-family residences ..... ☐ \$ 200  
All other developments ..... ☐ \$ 400

E. Request for continuance

1st request ..... ☐ No charge  
Each subsequent request  
(where Commission approves the continuance) ..... ☐ \$ 100

F. De minimis and other waivers ..... ☐ \$ 200

G. Public works facilities ..... [if public agency is applicant] ☐ No charge

H. Temporary events ..... [if not scheduled on administrative calendar] ☐ \$ 500

IV. ANY OTHER DEVELOPMENT NOT OTHERWISE COVERED

Development cost up to and including \$100,000 ..... ☐ \$ 600  
\$100,001 to \$500,000 ..... ☐ \$ 2,000  
\$500,001 to \$1,250,000 ..... ☐ \$ 4,000  
\$1,250,001 to \$2,500,000 ..... ☐ \$ 8,000  
\$2,500,001 to \$5,000,000 ..... ☐ \$ 12,000  
\$5,000,001 or more ..... ☐ \$ 20,000

TOTAL SUBMITTED ..... \$ \_\_\_\_\_

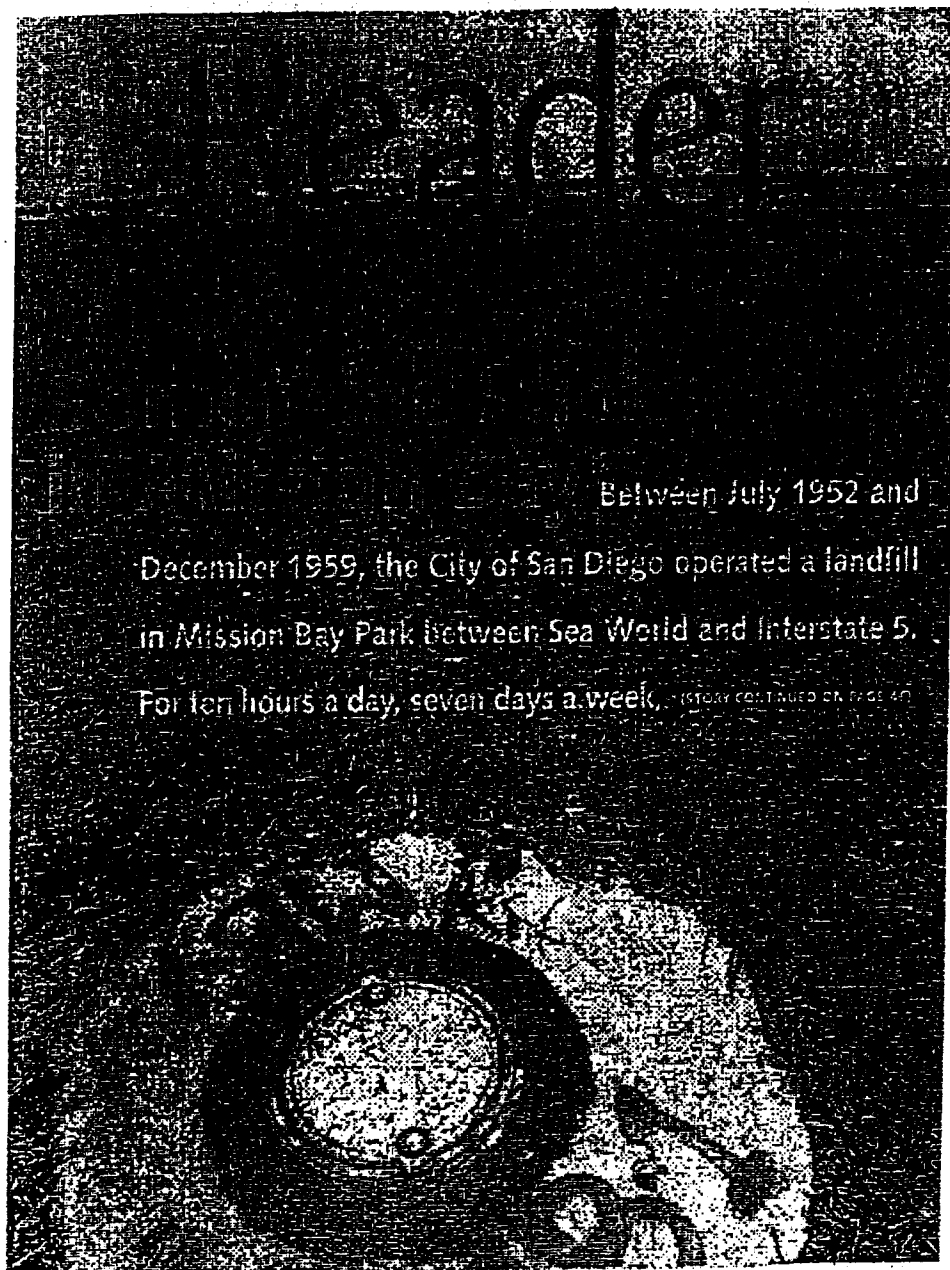
ADDITIONAL NOTES

1. Fees are assessed at the time of application, based on the project as proposed initially. If the size of a proposed dwelling or the amount of proposed grading is amended during the application review process, the fee is not changed.
2. If different types of development are included on one site under one application, the fee is based on the sum of each fee that would apply if each development were applied for separately, not to exceed \$20,000 (except as indicated in footnote 4).
3. Fees for after-the-fact permits shall normally be double the regular permit fee unless such added increases are waived by the Executive Director when it is determined that the permit could be processed by staff without significant additional review time resulting from the processing of the violation.

<sup>7</sup> If permit extension is objected to by Commission and application is set for a new hearing, then a new application fee is required, based on type of development and/or applicable calendar.

**EXHIBIT F**





Between July 1952 and  
December 1959, the City of San Diego operated a landfill  
in Mission Bay Park between Sea World and Interstate 5.  
For ten hours a day, seven days a week, HISTORY COLLECTED ON PAGE 40

# Something Stinks In Mission Bay

**Documents from those files indicated that the toxic waste  
being dumped into the Mission Bay landfill in the 1950s  
exceeded Convair's (1957) estimates of 200,000 gallons a year.**

City trucks hauled garbage to the 115-acre site—the sort of refuse you can see being dumped into the Miramar landfill. But during its operation, the Mission Bay landfill served as receiving grounds for millions of gallons of industrial wastes being produced by San Diego's aerospace industry. In some cases, these toxic substances were buried in steel drums. Other times they were poured into unlined holes 15 to 20 feet deep, below the level of the groundwater.

It is not possible to list the hazardous substances the city allowed to be dumped there. No cleanup of the Mission Bay landfill has been conducted. If anyone kept records of what substances companies were discarding there, the files have disappeared. After the permanent closure of the landfill in 1959, the memory of the toxic dumping seemed to vanish. In 1981, in response to a media report that a local firm might have deposited toxic materials at the landfill during the mid-1950s, Jim Gutzmer, the deputy director of the city's Solid Waste Division, responded (in a letter to a staffer at the local water quality control board), "The site was never knowingly used for toxic waste disposal.... We have no reason to believe any illegal dumping of toxic wastes took place at the site."

Within the next few months, Gutzmer apparently found a report that offered reason to believe that toxics had been dumped there. Written in February 1957 by the assistant chief plant engineer for Convair, the report asserted that a majority of the aerospace manufacturer's "process solutions" were being hauled and dumped "into the sanitary fill in the Mission Bay area." (The first laws regulating toxic-waste disposal were not enacted until the 1970s.) The plant engineer estimated that for 1957 through 1962 those deposits would amount to some 200,000 gallons annually of such substances as chromic, hydrofluoric, nitric, sulfuric, and hydrochloric acids; alkaline solutions; and paint and oily wastes.

Gutzmer further searched the records and (according to an October 1981 internal memo on file at the Regional Water Quality Control Board) found another disturbing document, a 1959 letter written by a local resident complaining about "objectionable practices being conducted at the Mission Bay location." This resident reported, "I have seen loads of dead animals being ground up by a tractor and powerful acids being disposed of at this sanitary landfill. The fill is not covered at all times, and the access roads and surrounding area are littered with debris and dust." According to the memo, Gutzmer planned to meet with then-City Manager Ray Blair and contact state health officials to discuss these findings. The 1981 memo also stated that a study would be proposed to sample the landfill for the hazardous wastes Convair had reported dumping.

But amnesia appears to have set in again. By the summer of 1983, no such research had been conducted. The city was concentrating on development on the Mission Bay site of what was to be one of the biggest hotels in San Diego County. Known as the Ramada Renaissance Resort, the project was to include 638 rooms, tennis courts, swimming pools, racquetball courts, restaurants, and banquet rooms. An adjoining 20-acre, \$1.4 million public park was planned. Revenues to the city were predicted to be more than a million dollars a year.

One week before Ramada was due to sign the lease, a news announcement brought development plans to a halt. On July 20, 1983, a local television station reported the revelations of an anonymous

Miller of the toxic cleanup group says calls to the regional Environmental Protection Agency headquarters have yielded no explanation for the 1993 turnaround, so the citizen group this past March sent a letter to the agency's regional director requesting a reevaluation. The agency since has invited Miller and his associates to submit information. They say they plan to send the Environmental Protection Agency a report about the misstated heavy-metal concentrations (in the 1983 Woodward-Clyde report) and concerns about fish contamination, along with test results about which they think agency officials may be ignorant.

One example, they say, is the amount of thallium in surface waters near the landfill over the last 15 years. Found in pure form in nature as an odorless and tasteless bluish-white metal, thallium combines with substances such as bromine, chlorine, fluorine, and iodine. Industrial processes employ such thallium compounds, which have also been used as a rat and ant poison. Humans who have ingested large amounts of the element over a short time have experienced "vomiting, diarrhea, temporary hair loss...effects on the nervous system, lungs, heart, liver, and kidneys...[and] death," according to the U.S. Department of Health and Human Services. (The effects of ingesting low levels of thallium over a long time or having skin contact with thallium are not known.) One federal government fact sheet adds that thallium "stays in the air, water, and soil for a long time and is not broken down," and it "builds up in fish and shellfish." A separate Environmental Protection Agency fact sheet confirms that thallium is "quickly bioaccumulated."

Because thallium builds up in sea life, the federal standard for thallium in fishing waters is just 6.3 parts per billion. Compare that to results of testing conducted by the city next to the old landfill in October 1985. Concentrations of thallium ranged from 900 to 1100 parts per billion. Yet no warnings about the fish caught in the area were posted. Subsequent test values have varied. In 1986 and 1987, the city reported concentration at 380 parts per billion. In 1988, the concentration was "less than 100" parts per billion. In 1997, thallium concentration was 91 parts per billion—more than 14 times the federal standard for fishing waters. Environmental Protection Agency literature describes the worst recorded conditions of thallium water pollution as 30 parts per billion, an amount found near ore-processing operations and streams draining ore-rich soils. Yet in the face of these test results, the City of San Diego has discontinued testing for thallium near the old landfill.

Asked about the thallium findings, Ferrier, the Refuse Disposal Division manager, responded, "There's nobody telling us that that spike in a single element like that is related to any kind of a release from the landfill." He elaborated, "It's impossible to release only thallium and not release everything else... That's not what leachate does. That's not the way landfills are.... So is there thallium in Mission Bay? I don't know, and I certainly don't know where it's coming from." If it is there, he declared, "It's not coming from the Mission Bay Landfill."

The members of Miller's group say that testing at and near the landfill over the last 15 years has yielded findings of other elevated pollutants. They cite a 1996 report written by a city consultant named EMCON that summarized concentrations of mercury found near the landfill between 1985 and 1995. The sampling reported amounts that were 17 to 600 times greater than the federal fishing-water standard.

Miller acknowledges that for all the research he and his associates have done, they haven't found any evidence that contamination from the landfill has harmed anyone except for the construction workers back in 1988. After news of the toxic deposits became public in 1983, a Bay

Park woman did write the county health department to report "an epidemic of cancer cases" in the area just downwind of the landfill. "I can name 19-20 cases in this small [two-block] area," she

Agency's assessments of the Mission Bay landfill as a cause for concern about the site and the scrutiny it has received.

The federal agency's awareness of the landfill apparently began around February 1984. At that time, the agency entered the Mission Bay landfill into an inventory of potential hazardous-substance sites. An Environmental Protection Agency evaluator gave the site a preliminary scoring to determine candidacy for the National Priorities List. This list is made up of waste sites known to have released hazardous materials to the environment and those posing a threat of such releases. Inclusion on it doesn't guarantee that the site will get Superfund monies for a cleanup, but it's a start. (The Superfund legislation, created by Congress in 1980, taxes chemical and petroleum industries to pay for finding, investigating, and cleaning up the nation's most hazardous waste sites.)

In its preliminary evaluation, the Environmental Protection Agency relied on the 1983 Woodward-Clyde report to assess the site. Although the evaluator gave the maximum number of points for quantity of materials deposited on the site and for toxicity the score came to 1.40 out of a possible 100. (To get on the National Priorities List, a site must score 28.5.)

In November 1989, another Environmental Protection Agency-funded assessment was conducted, and this one concluded that the landfill might be eligible for the National Priorities List. A report judged the potential for contamination of the surface water to be high, based on three factors: the landfill's proximity to Mission Bay, the quantity of waste, and the lack of containment of landfill materials. A contaminant release to the air was deemed possible.

In June 1990 the landfill underwent scoring according to a revised Environmental Protection Agency system. This time, according to a memorandum dated June 29, 1990, the evaluator discounted the groundwater (since no one would be drinking the brackish groundwater near the landfill). However, the old dump received positive scores for the air, surface-water, and "on-site exposure." The Mission Bay landfill's score came to 61.61, a number that placed it among the 50 most polluted hazardous waste sites in the country. A separate Environmental Protection Agency document appeared to elevate the landfill to "high priority."

In 1991, the San Diego dump site underwent an expanded Environmental Protection Agency-funded evaluation, scrutiny generally reserved (according to an agency publication) for sites "clearly headed for the NPL [National Priorities List]." This time, according to a September 25, 1991, memo, the evaluator gave the site a score of 49.06, lower than the previous score but above the cut-off for the priority listings. An accompanying memo criticized methods used by the City of San Diego and Woodward-Clyde. The memo said that the city and its consultants had used "detection levels" (for pollutants) that were so high they exceeded the Marine Ambient Water Quality Criteria. (Reporting that a substance cannot be detected above a certain level creates a sense of well-being but may mask contamination if the detection limit is too high.)

One more significant Environmental Protection Agency evaluation transpired at the landfill. In 1993, the agency hired Bechtel Environment, Inc., to evaluate the San Diego site. The Bechtel evaluator conducted no new tests, but in a report dated August 2, 1993, he judged only the air contamination potential to be significant. Groundwater, surface water, and soil offered no potential for transmitting the contamination in this evaluator's opinion. Nor did he explain why his opinion differed from previous evaluations. The old landfill's overall score thus amounted to only 14.01—too low to qualify for inclusion on the National Priorities List. The Environmental Protection Agency reacted swiftly. It placed the site in its archive, where no further action was planned.

question of whether hotel development could proceed. Miller has come to share this view and believes that the city's commitment to the project colored Woodward-Clyde's study. He argues that this bias is apparent throughout the report. Miller thinks the behavior of the city and Woodward-Clyde after the release of the study shows that something other than public-health concerns were uppermost in their minds.

The study results went to the state Department of Health Services in Sacramento, and officials there reviewed Woodward-Clyde's conclusions. On January 10, 1984, Thomas Bailey, a chief in the Toxic Substances Control Division, wrote a letter summarizing the state's response. Bailey pointed out that Woodward-Clyde had used criteria for hazardous waste that were not intended "for the purpose of assessing possible effects of long-term exposure." Furthermore, some of the chemicals found in the study "are of concern even at relatively low concentrations," Bailey declared in the letter. The division recommended several follow-up steps: a notice in the deed to inform future owners "of the presence of toxic chemical substances on the property"; and a ban on construction of "residences, schools, hospitals, day-care centers, or any other permanently occupied human habitation" and "permanent occupants of hotels, including live-in managers."

This dealt a blow to hopes for the Ramada resort. Bailey offered this: "Sites may be removed from this list [Abandoned Site List] as they are cleaned up or the potential hazard is mitigated. Accordingly, the list will appropriately reflect the status of the Mission Bay landfill when cleanup or mitigation is completed."

The following year, the city and the developer counseled by Woodward-Clyde, lobbied to get the state to revise this letter or replace it with one that would enable the project to proceed. Documents collected by Miller's group record conference calls involving up to nine representatives from the various parties, trips to Sacramento, and frequent correspondence. County officials joined in the efforts to pressure the state regulators to soften their reaction. Drafts of what the developer wanted the state to say (e.g., "We see no reason why the City and the developers of the hotel site cannot proceed immediately with the development of the hotel...") were sent north. The chief of the Toxic Substances Control Division yielded in a letter dated January 31, 1985. "[I]ntended to clarify and supersede the...letter...dated January 10, 1984," it neither retracted nor reaffirmed the old letter's technical comments, its call for a deed restriction, or its statements regarding cleanup and mitigation. But the new letter said the state would not designate the site a "hazardous waste property," and it said that the City and County of San Diego would bear responsibility for the Woodward-Clyde assessment of the site and for health and safety concerns associated with developing it.

Although the resort development never reached completion, the Woodward-Clyde study remains a force in discussions of the landfill. Robert Ferrier, the Refuse Disposal Division manager, cites it as a cause for belief that the old landfill is causing no problems. Ferrier points out that many other tests have been conducted since 1983. As with the Woodward-Clyde report, however, city officials and the citizens' group differ in their interpretations of test results.

Ferrier says the tests have painted a consistent and reassuring picture. "We have been testing for years, looking for any kind of difficulty resulting out of this, and we've yet to find it. We've been submitting the reports to all the regulatory agencies, and frankly...the people who get paid to do this for a living are not telling us that there is any kind of migration from that landfill." Ferrier says those government overseers have included the federal Environmental Protection Agency.

Members of the Mission Bay Park Toxic Cleanup group see the Environmental Protection

only recommendation at one point in time, my understanding is it's not. That was their recommendation at that time, but I haven't seen it substantiated by anybody else since."

The Mission Bay landfill's score  
came to 61.61, a number that placed  
it among the 50 most polluted  
hazardous waste sites in the country.

Science Applications recommended further investigation into the heavy metals in fish living near the landfill. In its 1983 report, the consulting firm stated that a bottom-feeding fish should be "carefully selected so as to represent a worst-case situation.... The tissue to be analyzed should include the edible portions of the fish in order to establish a link between the Fish and the humans." But such testing has never been done, according to Greg Peters, staff member of the Regional Water Quality Control Board. Each year the water board gets money to test fish caught at about eight stations, Peters says. The closest station from which fish have been collected is "right downstream of Fashion Valley Road, which is maybe a mile and a half, two miles, upstream. This really wouldn't reflect what the landfill could possibly be contributing," he says. Fish have been collected from Tecolote Creek, upstream from where it enters Mission Bay. "So there again, we don't have any data on the possible influence of material in the landfill." Peters says the problem with analyzing fish caught near the San Diego River mouth is that "if you find a fish that has somewhat elevated levels [of a pollutant], you're not sure where it got it. Especially if it's a fish that also frequents the ocean and comes into that particular area where you caught him."

The landfill lobbying group says although the fish-toxicity table appears to be one of the most egregious errors in the 1983 study, other aspects of it trouble them too. Miller believes (based on the documents in the Woodward-Clyde report's appendix) that the consultants understated the toxic wastes deposited in the Mission Bay landfill. Miller thinks the report's statement that "Overall, no unusually large concentrations of heavy metals or hazardous organic chemicals were found in the landfill waste" is misleading. "I mean, we know that millions of gallons of toxic materials were dumped there. So where did they go?"

Miller says independent tests for cyanide in the soil and waste materials at the Mission Bay landfill cast doubt on Woodward-Clyde's 1983 testing. Although Woodward-Clyde reported it had failed to detect cyanide. Miller discovered an analysis conducted in the fall of 1983 by the California Department of Health Services. The state lab found cyanide in all samples from this site that it tested, with concentrations ranging from 10 to 35 parts per million.

Marx, the one-time county employee who works for URS (formerly Woodward-Clyde), downplayed the discrepancy. "This may just be a lab thing," he stated. If one set of tests had shown 10 parts per million and the other 3000 parts per million, "then I'd think there would be a scratch-your-head-and-really-look-at-this-a-lot-harder issue," he said.

Marx says his "overriding concern" with Woodward-Clyde's 1983 report was the "big-picture"



Science Applications, Inc., collected sediment and surface-water samples from the bay and the flood-control channel. Science Applications wrote a report of its findings (released in October 1983) and concluded that overall the waters of Mission Bay were "quite clean relative to priority pollutants," approximating the quality of open ocean water ("except for slightly increased levels of mercury"). When it came to sediments in the bay and channel, however, Science Applications stated that "there should be cause for concern." The consulting firm found more zinc, thallium, lead, nickel, and beryllium in the Mission Bay sediments than reported for the polluted New York Bight. The average level of mercury in Mission Bay was greater than that of the New York Bight or the Persian Gulf. And the levels were highest at the two collecting stations on either side of the landfill, making it suspect, in Science Applications' judgment, as "a probable source of metals."

Woodward-Clyde had based its reassuring statements about the Mission Bay fish consumption upon Science Applications' sediment data. How could this be? Miller and his associates noted that one of the tables in the Woodward-Clyde report did contain the same raw data that Science Applications had collected and reported. However, in the section where Woodward-Clyde analyzed the human health risks, the consultants had created another, more selective table. This table—the one most readers would peruse—is curious. It correctly states the amount of mercury that Science Applications found. But it understates the amount of four other heavy metals found in the sediments by a factor of a thousand. In other words, instead of 133 milligrams of lead per kilogram of sediment (the amount found by Science Applications in the flood-channel collecting station), Woodward-Clyde reported that only .133 milligrams had been found. Instead of 29 milligrams per kilogram of arsenic, Woodward-Clyde based its metal-consumption analysis upon an arsenic concentration of .029 milligrams per kilogram. The table does not report findings for eight other heavy metals identified by Science Applications.

When Miller and his associates reworked Woodward-Clyde's analysis based upon the heavy-metal concentrations found by Science Applications, they came up with the following estimates: Someone who eats seven ounces per month of Fish caught next to the landfill would be getting 13 times the amount of lead considered safe for consumption in drinking water. They would be consuming twice the amount of arsenic, 7 times the amount of beryllium, 3.65 times the amount of chromium, 6.7 times the amount of copper, and 25 times the amount of thallium allowed by drinking-water standards.

None of the authors of the Woodward-Clyde study remain with the firm, which was sold about two years ago and is now known by the name URS. However, David Marx, current manager of the office's Environmental Management Division, knows about the Mission Bay landfill. In 1983 Marx worked for the San Diego County health department. He read the Woodward-Clyde report when it was published and agreed to answer my questions about the report. Asked if Woodward-Clyde erred in representing the tables relating to heavy-metal concentrations, he said, "I really don't know how to answer that... There maybe an issue here. There may not be an issue." Further study of data and worksheets used by Woodward-Clyde might yield an explanation, he suggested. But before spending time and money to determine if explanatory data exists, "We would really need to hear from the city, who was our client in this particular project."

Robert Ferrier, deputy director of the city's Refuse Disposal Division, is the city employee who today bears responsibility for the Mission Bay Landfill. Asked whether Woodward-Clyde's table was in error, he said, "Perhaps. Perhaps not. There's no reason to assume SAI is right, any more than there is that Woodward-Clyde is." When reminded that Science Applications collected the data, Ferrier responded, "Oh, I understand that.... Well, I'm not saying I would trust one more than the other. That's all I'm saying. I mean, just because somebody makes a recommendation, if that was the

at times the breeze carries peppy voices of the park's animal-show announcers here. On the eastern side of the asphalt lot, dirt covers the old dump. Ash-colored mulch has been spread over some of the ground, but other sections lie naked. Short, mean plants grow here.

A wide concrete pathway lies beyond this section, next to the water. Sometimes someone strolls or Rollerblades along it. The Mission Bay Park Plan calls for additions: an amphitheater, playgrounds, picnic facilities. But no money has been budgeted to build these. "It could sit there for some time without anything further happening," one city official stated.

That's good news to Jace Miller. A shipwright and aspiring novelist who recently moved to Imperial Beach from Ocean Beach. Miller, 56, lobbies for cleanup of the old landfill. He explains that he became interested after reading a 1995 article about the imminent opening of the South Shores Park boat basin. He recalls, "I thought it would be impossible for the site to be benign, because of its location in a public park, sandwiched between two bodies of water, and because of the large amounts of toxics that had been dumped there." Miller says he started talking to the Sierra Club and Earth First and found, "No one knew about it. No one I talked to had ever heard about it. The general reaction was that it sounded pretty far-fetched. I began to get the impression that information about the dump had been kept from the public"

Miller says he enlisted other volunteers, and his group (dubbed Mission Bay Park Toxic Cleanup) has been researching the history of the site. Miller says, "I think it's a dangerous site and that the public should be warned about it." He says many of the site studies appear to contain serious flaws.

Miller's group believes that a disturbing error can be found in Woodward-Clyde's 1983 study. One of the most important conclusions of that study was that the toxic wastes deposited in the Mission Bay landfill do not pose a human health hazard. "There are practically no exposure pathways to humans," the report asserted.

The study's authors explained that the groundwater at the site was too salty to be drinkable. "Although ingestion of bay water by swimmers can occur, the amount actually swallowed by a person is normally extremely small; poisoning could occur only if acutely toxic amounts...were present in the water," they reasoned. Furthermore, the layers of dirt over the landfill appeared to be blocking the escape of any toxic gases.

Instead, the primary creatures at risk from landfill contamination "are the aquatic organisms inhabiting the San Diego River flood-control channel and Mission Bay," the report stated. It conceded that "consumption of highly contaminated fish has caused serious human health problems, particularly in Japan." The consultants looked at concentrations of toxic heavy metals found in the water and sediments of the flood-control channel and bay at sites near the landfill. In order to take into account the fact that heavy metals tend to "bioconcentrate" in the flesh of marine animals, the consultants multiplied the highest concentrations of those metals by two (the factor that they claim was recommended by the Environmental Protection Agency). Then they calculated how much of each of the metals would be consumed by a person eating 6.5 grams of fish a day (a little less than a quarter of an ounce, or roughly seven ounces of fish per month). When they compared this amount to the estimated safe consumption levels derived from drinking-water standards, they concluded that "no human health effects should result from consumption of fish inhabiting Mission Bay."

That statement apparently assuaged concerns of government regulators who read the Woodward-Clyde report 17 years ago. But Miller's group took a hard look at the analysis and the data upon which it was based. Woodward-Clyde didn't gather that data; another local consulting firm called



Contreras amended her recollection: "I'm beginning to think or recall that maybe there were just so many problems with the site that the deal fell apart."

In 1988 the city began carrying out other plans for the property (dubbed by then "South Shores Park"). The first, \$4.5 million phase of these plans involved carving out a nine-acre cove north of the landfill. This was to serve as a boat-launching basin, and next to it a ten-lane boat ramp was to be constructed. Other improvements included a 16-acre parking lot, a public beach situated across the lagoon from the boat ramp, two boarding docks, and restroom facilities. Apprised of the City's plans, an engineer from the Regional Water Quality Control Board office had expressed concern to the city in a letter dated June 5, 1987, that excavation might "result in the disruption of the landfill cover and/or involve excavation and exposure of landfill waste materials." But Woodward-Clyde (once again the city's consultant) responded that a 50-foot buffer zone would be maintained between the boat basin and the boundaries of the old landfill. Furthermore, an earthen berm would separate the waters of the bay from the boat basin until the excavation was complete.

In early October 1988, about a month after grading began, some workers excavating the site smelled the odor of rotten eggs and began vomiting and experiencing headaches. Three were hospitalized, according to news reports. (One of the workers died thereafter, and ten months later his widow filed a wrongful-death suit. The city paid \$8500 to settle the suit, according to a note in the case files.) An environmental consultant brought in from Scottsdale, Arizona, to investigate the incident concluded that workers had encountered a pocket of hydrogen sulfide gas. Although Woodward-Clyde's 1983 study had not found this poison, workers' symptoms matched many of its effects. The consultant recommended that workers be required to wear oxygen masks.

More trouble developed. This time it took the form of a reddish-orange seepage that appeared in the side wall of a ground-cut at the level of the former water table. A field technician employed by the consulting firm collected liquid and soil samples. The results revealed elevated levels of pollutants: dichloroethene, a degreasing agent; TCA, a common industrial solvent; and carbon tetrachloride, the carcinogen whose dumping spurred Woodward-Clyde's 1983 report. The latter was found in a concentration more than 900 times the state's maximum for drinking water.

"We've broken the seal on the tomb, and the curse has been released," a San Diego Evening Tribune article in August 1989 quoted Michael Pallamary, a civil engineer who was chairman of a city panel seeking to clean up Mission Bay. The city ordered more testing of the surface water and sediments in the boat basin. Again Woodward-Clyde's findings were reassuring. None of the pollutants detected in the surface water qualified for classification as hazardous waste, the firm announced. Delays continued to plague the project. Not until 1996 did the city open the boat-launch ramp—six years behind the original schedule.

Today South Shores Park has an eerie, unfinished look. You reach it by turning in to an access road off Sea World Drive. This leads to an asphalt parking lot studded with palm trees set in planters designed to keep roots away from whatever lies below. Big enough for 240 cars and trailers, the parking lot often holds no more than 2 or 3 vehicles. At the northwest corner of the lot, two restroom facilities, gray with blue-tile accents, stand like sentries overlooking an expanse of the white concrete ramp that could accommodate ten powerboats. Yet many mornings, there are none, nor can any human figure be seen on the beach.

The old landfill lies beneath the access road and parking lot, but according to 1999 maps of the park, part of it also extends under the graded dirt to the west of the lot. This stretch abuts the eastern edge of Sea World's property, and official maps show it as a future parking site for the marine park;

September 1983. Woodward-Clyde also began burrowing into old files. Documents from those files indicated that the toxic waste being dumped into the Mission Bay landfill in the 1950s exceeded Convair's (1957) estimate of 200,000 gallons a year. One report attached to a 1958 letter from the superintendent of the city's sewerage division to the city manager estimated that four companies (Convair, Ryan, Rohr, and Astronautics) each year were generating 792,000 gallons of chromic, hydrofluoric, nitric, sulfuric, and hydrochloric acids; dichromate; cyanide; and paint and oil wastes. Other projections from this period refer to the need to dispose of at least one million gallons a year of industrial wastes. Contemporaneous documents state that some substances were going into the city sewers and the sea, as well as being dumped at the sites where they were generated or trucked to disposal facilities in the North County or Los Angeles. But the Mission Bay landfill received most of the poisonous wastes, according to the reports; several documents describe the facility as San Diego's only Class I landfill. (A Class I landfill is approved to receive toxic wastes.)

Woodward-Clyde released its study results on November 17, 1983. Contradicting documents in their appendix, the consultants stated—without any explanation—that "the total volume of hazardous waste being generated in San Diego during the late 1950s was less than 400,000 gallons/year." If three-quarters of this amount went into the Mission Bay landfill over its seven and a third years of operation, then the old dump would have received 2.2 million gallons of toxic waste, they concluded. (Stephen Lester, science director for the Center for Health, Environment, and Justice in Falls Church, Virginia, when contacted for this article, stated that "Most of the chemicals that are dumped in these landfills pretty much stay undegraded in the ground for tens and even hundreds of years.")

Magnetic and electromagnetic surveys revealed that the site harbored perhaps 5000 pounds of metal per acre, most of it at or below the water table. This confirmed old eye witness accounts that metal barrels of industrial wastes had been buried there. "At those depths (15 to 20 feet below the surface) most metallic drums or barrels should corrode to release their contents in less than ten years," the report said. Woodward-Clyde used the results of the magnetic surveys to decide where to bore for samples. But rather than choosing places where the most metal appeared to be concentrated, the consultants selected areas with "only moderate probabilities of containing barrels or barrel residues," according to the report. This was done "in order to limit the potential for rupturing any intact barrel during the field investigation." Even so, the subsequent chemical analyses found more than 60 Environmental Protection Agency "priority pollutants" on the property, including 12 heavy metals (elements such as mercury and arsenic), 38 organic compounds such as acetone and carbon tetrachloride, and 12 pesticides.

Despite this, Woodward-Clyde reassured the city that the resort development could proceed. The highest concentrations of pollutants found in the study "are low," the report announced, "and do not exceed existing California State or Federal criteria for the identification of hazardous waste." The low concentrations coupled with "the low potential for their migration, and the few pathways for human exposure" meant that "the landfill wastes do not pose a significant health hazard to humans." Semi-annual testing of the bay and flood-control-channel waters adjacent to the landfill should continue "for an indefinite period," they recommended, and they warned that if development proceeded, landfill gases might be released. These would need to be collected and disposed of. But no significant cleanup was necessary, according to Woodward-Clyde.

The Ramada development never got built. Asked about the project's history, Bonnie Contreras, a staff member in the city's Economic Development Division who worked on the development plans, said she couldn't remember what killed the project. "It seems to me that it was either the financing or just the partnership fell apart." Reminded of the toxic history of the site that emerged in 1983,

source who claimed to have been a truck driver during the 1950s. According to subsequent newspaper reports, the source said he had dumped hundreds of barrels of the carcinogen carbon tetrachloride at the Mission Bay landfill. This wasn't the first time someone had linked carbon tetrachloride to the old dump. An employee in the San Diego office of the state's Abandoned Site Project had received a tip about it after the office had opened in September 1982, according to an internal state government memo written in August 1983. The state employee had met with officials from the City of San Diego as well as from the county and had "expressed his concern that sampling should be done before there was any development of the area." But "No action was taken," according to the August 1983 memo. With the televised report of the truck driver's allegations, pandemonium erupted. Ramada announced that construction plans would be put on hold until the hotel chain could be convinced that the property was safe. Pressed by journalists, Gutzmer stated that the city had only become aware of the Convair letter in April 1983. "That was the first time...the city was made aware that industrial wastes had been mixed with household wastes," the San Diego Union quoted him as saying on July 24. Gutzmer implied that officials had no knowledge of the carbon tetrachloride dumping until the TV news report.

Then-City Councilman Mike Gotch (whose district included Mission Bay) told reporters that he had learned about the bay's toxic history from the TV news report. "If city staff knew it 90 days ago, why didn't members of the media know?" Gotch demanded, according to a July 26, 1983, article in the San Diego Union, apparently ignorant of the fact that city, state, and water-board officials had known about the Convair report two years before the news became public. Gotch's voice was among those that called for a study of the property.

In order to salvage the hotel-development project, city officials announced that they wanted to have that study completed in less than 60 days. The city council approved funding for the inquiry (which cost about \$300,000), and the city handpicked the consulting firm to do the work. The council waived the consultant-selection process "because of the urgency," City Manager Ray Blair explained to a competing firm.

Chosen to conduct the study was Woodward-Clyde Consultants, a geophysical and environmental firm with experience in city-funded projects. Woodward-Clyde had done at least two previous studies for the city at the Ramada project site. Early in 1980 the consulting firm had dug test pits in an effort to define the boundaries and composition of the old dump. (The dump had been covered with material dredged up when Mission Bay was being created between 1960 and 1962.) Woodward-Clyde had concluded in a 1980 letter to the city that the property was "suitable for development" but had cautioned, "Special treatment of near-surface soils and underlying trash fill areas may be necessary...."

Evidently, Woodward-Clyde had not tested for toxic wastes in 1980, but the 1983 study was to make up for that. The study was to ascertain whether any hazardous materials were present at or near the landfill, and, if so, what their concentrations were. Woodward-Clyde proposed to collect groundwater from 20 wells to be drilled on and near the landfill site. Cover soil, landfill material, and underlying alluvium extracted from 21 boring sites would be scrutinized, and gases from 10 wells would be examined. Another consulting firm, Science Applications, Inc., would study surface water and sediment from Mission Bay and the San Diego River flood-control channel, two bodies of water that adjoin the landfill to the north and south. Woodward-Clyde was to assess whether any remedial measures or further field research was necessary.

The city asked the county and state health-services departments to review the proposed study, and officials from both pronounced it adequate. Sample collection began in late August and early

wrote, "a cancer case in almost every house." Although Miller's group found a letter from the county acknowledging her concerns, they found no records indicating an investigation.

Miller asks, "Why wait?" until harm emerges. "Why not err on the side of caution and find out what is going on there? There are large amounts of toxic chemicals and heavy metals buried in Mission Bay, and nobody is taking any action." He adds, "The documented pattern of avoidance, denial, whitewash, and contradiction regarding the Mission Bay landfill is too pervasive to ignore."

Miller says his group hopes to file an environmental lawsuit against the city. They're seeking legal assistance with such an action. In the mean time, Miller has become convinced that "cleanup is the only option" for what he calls "America's Finest Toxic Waste Dump."

Ferrier, the city's Refuse Disposal Division deputy director, says the city has never evaluated costs of cleaning up the old landfill. But he suggests it would be an "interesting scenario" to recommend "that we ought to go into the middle of Mission Bay and excavate an area of that magnitude and transport it." Just imagine, the bureaucrat suggests, what people would say if you put the following question to them: "We're going to go dig this up and transport it across your street. Do you mind?"

—Jeannette De Wyze

**EXHIBIT G**

6-01-29



CHRISTIAN WHEELER  
ENGINEERING

REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION

SEA WORLD ATLANTIS PROJECT  
SAN DIEGO, CALIFORNIA

PREPARED FOR:

SEA WORLD ADVENTURE PARKS  
200 SEA WORLD DRIVE  
SAN DIEGO, CALIFORNIA  
92109-7904

PREPARED BY:

CHRISTIAN WHEELER ENGINEERING  
4925 MERCURY STREET  
SAN DIEGO, CALIFORNIA  
92111



CHRISTIAN WHEELER  
ENGINEERING

October 16, 2000

SeaWorld Adventure Parks  
200 SeaWorld Drive  
San Diego, California 92109-7904

CWE 200.338.2

**SUBJECT: REPORT OF PRELIMINARY GEOTECHNICAL INVESTIGATION,  
SEA WORLD ATLANTIS PROJECT, SAN DIEGO, CALIFORNIA.**

Ladies and Gentlemen:

In accordance with your request and our Proposal dated June 5, 2000, we have completed a preliminary geotechnical investigation for the subject project. The purpose of this report was to address the geotechnical and geologic aspects of the proposed project. We are presenting herewith our findings and recommendations.

In general, we found that the site is suitable to support the proposed Atlantis splash ride project, provided the site preparation and foundation recommendations presented in this report are strictly complied with. The main geotechnical conditions that will impact the prepared project are relatively shallow groundwater, compressible and liquefiable soils below the water table, groundshaking during major seismic events, and relatively loose soils above the water table. Specific recommendations to mitigate these conditions are presented in the accompanying preliminary geotechnical report, and include removal and replacement of the near-surface soils as uniformly compacted fill, construction of a pore water pressure dissipation blanket below critical structures, surcharging areas where settlement-sensitive structures will be constructed, and using concrete mat foundations with relatively light soil bearing pressures. The pore water pressure dissipation blanket and surcharging are only required for the three tower structures, the aquarium exhibit, and the LSS building.

If you have any questions after reviewing this report, please do not hesitate to contact the undersigned. This opportunity to be of professional service is sincerely appreciated.

Respectfully submitted,

CHRISTIAN WHEELER ENGINEERING



Charles H. Christian, RGE #00215

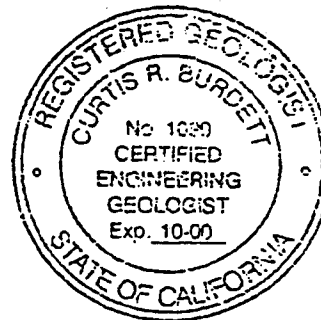


Curtis R. Burdett, CEG #1090

cc: (2) SeaWorld

(1) Peller & Associates

(2) PGVA





## TABLE OF CONTENTS

	PAGE
Introduction and Project Description .....	1
Scope of Services.....	5
Findings .....	6
Site Description.....	6
General Geology and Subsurface Conditions.....	7
Geologic Setting and Soil Description.....	7
Artificial Fill.....	7
Bay Deposits.....	7
Groundwater.....	8
Tectonic Setting.....	8
Geologic Hazards.....	9
General .....	9
Landslide Potential and Slope Stability .....	9
Ground Shaking.....	9
Seismic Design Parameters .....	10
Liquefaction.....	10
Lateral Ground Spreading.....	12
Flooding .....	12
Tsunamis .....	12
Seiches .....	12
Settlement Analysis .....	12
Static Settlement Analysis.....	12
Dynamic Settlements Due to Liquefaction .....	13
Conclusions.....	14
Recommendations .....	14
Grading and Earthwork .....	14
General.....	14
Observation of Grading .....	14
Clearing and Grubbing .....	15
Excavation Characteristics .....	15
Site Preparation.....	15
Elevator Tower, Drop Tower, Stair Tower, Aquarium and LSS Building .....	15
Elevated Ride Track.....	16
At-Grade Ride Channel and Artificial Lakes .....	17
Ride Water Filter Plant.....	17
Support Facility Building, Gift Shop, Entry Canopy and Restroom Facility .....	17
Exterior Flatwork Areas.....	17
Miscellaneous Improvements.....	18
Dewatering.....	18
Processing of Fill Areas.....	18
Compaction and Method of Filling.....	18
Select Grading.....	19
Imported Fill Material .....	19
Fill Slope Construction .....	19
Surface Drainage .....	20
Slope Stability .....	20
General.....	20
Erosion Control .....	20

Foundation Recommendations .....	20
General.....	20
Concrete Mat Foundations .....	21
General.....	21
Anticipated Settlements.....	21
Conventional Foundations.....	22
General.....	22
Bearing Capacity.....	22
Footing Reinforcing.....	22
Lateral Load Resistance.....	22
Foundation Excavation Observation.....	22
On-Grade Slabs .....	23
Interior Slabs.....	23
Moisture Protection for Interior Floor Slabs .....	23
Exterior Concrete Flatwork.....	23
Earth Retaining Walls .....	23
Bearing Capacity.....	23
Passive Pressure.....	24
Active Pressure.....	24
Backfill.....	24
Limitations .....	24
Field Explorations.....	26
Laboratory Testing.....	27

## ATTACHMENTS

### TABLES

Table I	Maximum Bedrock Accelerations, Page 9
Table II	Seismic Design Parameters, Page 10

### FIGURES

Figure 1	Site Vicinity Map, Follows Page 1
Figure 2	Site Preparation Detail, Follows Page 16

### PLATES

Plates 1	Site Plan
Plates 2-9	Boring Logs
Plates 10-12	Results of EQFAULT Analysis
Plates 13-16	Results of LIQUEFY 2 Analysis
Plate 17	Seismic Induced Settlement Analysis
Plates 18-19	Laboratory Test Results
Plates 20-25	Consolidation Curves

### APPENDICES

Appendix A	References, Topographic Maps, and Photographs
Appendix B	Recommended Grading Specifications – General Provisions

located on the north side of the ride between the end of the elevated ride track and the exiting platform. The ride track will pass through these artificial lakes. The lakes' construction will consist of a liner with a three- to four-inch thick shotcrete ballast. The boundary grade separator walls will be reinforced concrete.

- **Coaster Station:** The ride channel at the coaster station (loading and exiting docks), and the ride car maintenance area and transfer track at the west end of the coaster station, will consist of a reinforced concrete structure with a depth of about six to ten feet below the loading and exit platforms. The channel in the maintenance cove/transfer track area is expected to have a static load of about 710 kips with a mat contact pressure of 250 pounds per square foot. The exiting/loading channel is expected to have a static load of 615 kips with a contract pressure of approximately 275 pounds per square foot.
- **Gift Shop:** A retail store, approximately 936 square feet in area, will be located south of the ride exit platform. This structure will be single-story and of light, steel-frame construction, with an on-grade concrete floor slab. This structure will be supported by a partial concrete mat foundation system, with a contract pressure of about 200 pounds per square foot. This includes the weight of the floor slab and the live load on it.
- **Aquarium:** West and south of the retail store, an above-grade aquarium will be constructed. This feature will consist of two circular tanks, one 24 feet and one 30 feet in diameter, that will extend approximately ten feet above the surrounding ground surface. These structures will have a concrete mat foundation and acrylic glass sides with steel or concrete mullions between the acrylic panels. The static mat foundation contact pressure is estimated to be about 950 pounds per square foot.
- **Ride Entrance Canopy:** A semi-circular, gated canopy will be constructed at the entrance to the ride, which will be located between the retail store and the drop tower. This structure will consist of a light steel-frame structure supported by a partial mat foundation. The static mat contact pressure for this structure is estimated to be 150 pounds per square foot.

- **Facility Support Building:** The facility support building will be located between the stair tower and coaster station. This structure will consist of a light, steel-frame building with metal siding. The structure will be supported by a partial mat foundation with a contact pressure of approximate 175 pounds per square foot. This building will contain the control consoles to operate the ride and will house the various equipment and other support elements for the water ride.
- **Ride Water Filter Tanks:** Filter tanks for the ride water will be located on the north side of the facility support building. The tanks are pre-manufactured elements that stand vertical on their own integral support system, which is bolted to the mat foundation. No other specific information is available at this time regarding the structural features of this filter system. However, we anticipate that the tanks will have a maximum height of about 12 feet and a maximum diameter of about 10 feet. We also anticipate that they will be supported by a full concrete mat foundation with static contract pressure of 570 to 750 pounds per square foot. We understand that this structure is not considered to be as critical, settlement-wise, as the LSS Building described in the following section.
- **LSS Building:** This building, located west of the aquarium, will be a single-story, masonry structure with a concrete mat foundation. The building will house filter and support equipment for the aquarium. The static mat foundation contact pressure in this area is estimated to be 570 to 750 pounds per square foot.
- **Locker Rooms:** A relatively small structure will be attached to the west side of the LSS Building, that will house employee lockers and dressing room facilities. This structure is a pre-engineered, light metal-frames building that will be supported by a partial concrete mat foundation. The static mat foundation contact pressure in this area is estimated to be 175 pounds per square foot.
- **Public Restroom:** A public restroom facility will be constructed west of the ride area and will be approximately 600 square feet in area. This structure will be single story and will be of light-gauge, metal frame construction. The building will be supported by shallow spread footings and will have an on-grade concrete floor slab.

Precise grading for the subject project is anticipated to consist of cuts and fills of less than about five feet from the existing grades.

This report has been prepared for the exclusive use of SeaWorld of California and their design consultants for specific application to the project described herein. Should the project be changed in any way, the modified plans should be submitted to Christian Wheeler Engineering for review to determine their conformance with our recommendations and to determine if any additional subsurface investigation, laboratory testing and/or recommendations are necessary. Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, express or implied.

#### SCOPE OF SERVICES

Our preliminary geotechnical investigation consisted of surface reconnaissance, subsurface exploration, obtaining representative soil samples, laboratory testing, analysis of the field and laboratory data and review of relevant geologic literature. Based on past experience in the vicinity of the subject site, and in consideration of the RFP, we drilled four test borings in the project area in order to explore the subsurface soil conditions and to obtain soil samples for laboratory testing. More specifically, the intent of our investigation was to include, as applicable, the following elements listed in the RFP:

- a) General description of the site and its topography;
- b) A short description of the building structure upon which the recommendations are based;
- c) A summary of the field investigation and laboratory testing procedures;
- d) A plan showing the location of numbered soil borings and the proposed structure;
- e) A summary of the field exploration and laboratory test results, including logs of the borings and classification of the soils encountered in accordance with the Unified Soil Classification System;
- f) Elevations of the groundwater table encountered in our borings;
- g) Preliminary seismic assessment of the site;
- h) Liquefaction potential of the site;
- i) Preliminary recommendations, which will include the following:
  - 1. Excavation and backfill requirements, indicating compaction requirements;

2. Requirements for minimizing liquefaction;
3. Dewatering requirements;
4. Recommended foundation type and recommended allowable bearing capacity;
5. Settlement and differential settlement predictions;
6. Recommendations for resisting hydrostatic pressure on the below-grade elements of the building structure;
7. Lateral pressures against retaining and basement walls, including at-rest pressures;
8. Special construction requirements;
9. Recommendations and proposed geotechnical engineering services for final design of the building; and
10. Pertinent engineering and testing data substantiating the recommendations.

## FINDINGS

### SITE DESCRIPTION

The project site is located along the southern side of the Pacific Passage area of the Mission Bay Park, within the northeast portion of the existing SeaWorld facility, in San Diego, California. The northern portion of the project site is currently undeveloped and outside of the perimeter fencing along the northern side of the park. Landscaping storage areas, small detached office buildings, and trash compactors currently exist in the central portion of the project site. The southern portion of the subject site is within an existing parking area sealed with asphalt and chip-seal. The site is bounded to the north by undeveloped land and the Pacific Passage area of Mission Bay and to the east by a City boat ramp facility and parking lot. To the west, the site is bounded by existing SeaWorld park facilities, and to the south, parking and drive areas extend to Sea World Drive. The project area slopes gently to the northeast towards Mission Bay. Based upon the referenced topographic maps and site plans provided to us, on-site elevations are estimated to range from 22 feet Sea World Datum (SWD) within the southwest portion of the project area to approximately 16 SWD within the northeast corner of the project site.

Some underground utilities associated with the existing temporary improvements are expected to exist in the project area. Any such utilities are expected to be removed during demolishing. A storm drain pipe crosses the central portion of the project area from south to north. This storm drain is expected to be rerouted during the construction of the project.

## GENERAL GEOLOGY AND SUBSURFACE CONDITIONS

**GEOLOGIC SETTING AND SOIL DESCRIPTION:** The subject site is located in the Coastal Plains Physiographic Province of San Diego County. Based on the results of our limited exploration and analysis of readily available, pertinent geologic and geotechnical literature, the site is underlain by man-placed fill materials over Quaternary-age bay deposits, which were observed to extend to depths greater than our maximum explored depth of 50 feet below existing site grades. These materials are described below:

**ARTIFICIAL FILL (Qaf):** Observed in each of our exploratory borings, mechanically- and hydraulically-placed fill materials were noted to extend to approximately 11 feet to 14 feet below existing site grades (9½ feet to 4½ feet SWD elevation). Based on the similarities in composition and consistencies of these fill materials, no differentiation between mechanically- and hydraulically-placed fills is utilized in this report. In general, the fill was noted to consist of silty sands (SM) and poorly graded sands (SP) in three of the four borings (B1, B3 and B4). These materials were heterogeneous, varied in consistency from loose to medium dense, and were noted to be generally moist. In B2, we encountered 6 feet of fill that consisted of sandy clay (CL) between a depth of 3 to 9 feet; the rest of the encountered soils in B3 were silty sands (SM) and poorly graded sands (SP) similar to the materials encountered in the other three borings. The sandy clay was noted to be moist, medium stiff, and very micaceous. Due to the variable density and compressible nature of the encountered fill materials, the existing fill materials are not considered suitable to support settlement-sensitive structures.

**BAY DEPOSITS:** Quaternary-age bay deposits were encountered at approximate depths of 11 feet to 16 feet below existing site grades (9½ feet to 4½ feet SWD). In general, the bay deposits were observed to vary from silty sands (SM) to clayey sands (SC) to sandy, silty clays (CL) and to poorly graded sands (SP). The predominant soil types appeared to consist of the sandier soils, with only a few relatively thin strata of sandy clay. The sandy clay layers were noted to be very soft to soft, while the silty sand and clayey sand layers were noted to be loose to medium dense. However, in both Borings B1 and B3, the soils below about 40 feet were found to be dense, slightly clayey sand (SC-SP) or dense to very dense, poorly graded sand (SP).

**GROUNDWATER:** Groundwater was encountered in each of our exploratory borings at depths ranging from approximately 12 feet to 14 feet below existing site grades. These depths correspond to a groundwater level which varies from a high of approximately 6½ feet SWD (observed within B1 and B2) to a low of 5 feet SWD (observed within B3 and B4). Therefore, the hydraulic gradient is gently sloping to the northeast, towards Mission Bay. Based on the nature of the proposed construction, as well as the observed depth to groundwater, we do not expect any groundwater problems to develop due to the proposed construction. The excavation for the ride pit in the elevator structure will, however, be very close to the groundwater table.

**TECTONIC SETTING:** It should be noted that much of Southern California, including the San Diego County area, is characterized by a series of Quaternary-age fault zones that consist of several individual, en echelon faults that generally strike in a northerly to northwesterly direction. Some of these fault zones (and the individual faults within the zone) are classified as "active" according to the criteria of the California Division of Mines and Geology. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years). The Division of Mines and Geology used the term "potentially active" on Earthquake Fault Zone maps until 1988 to refer to all Quaternary-age faults for the purpose of evaluation for possible zonation in accordance with the Alquist-Priolo Earthquake Fault Zoning Act. The Alquist-Priolo Act requires the State Geologist to zone faults that are "sufficiently active" and "well-defined" to have a relatively high potential for ground rupture. The Division of Mines and Geology no longer uses the term "potentially active" but the City of San Diego has elected to continue to use the term "potentially active" to refer to certain faults that demonstrated movement during the Pleistocene epoch (11,000 to 1.6 million years before the present) but that do not have substantiated Holocene movement. It should be recognized that the Alquist-Priolo Act (Division 2, Chapter 7.5, Section 2624) authorizes individual cities and counties to establish policies and criteria which are stricter than those established by the Alquist-Priolo Act.

A review of available geologic maps indicates that the active Rose Canyon Fault Zone is located approximately 1.4 miles east of the subject site. Other active fault zones in the region that could possibly affect the site include the Coronado Bank and San Clemente Fault Zones to the west, the offshore segment of the Newport-Inglewood and Palos Verdes Fault Zones to the northwest, and the Elsinore, Earthquake Valley, San Jacinto, and San Andreas Fault Zones to the northeast.



## GEOLOGIC HAZARDS

**GENERAL:** No geologic hazards of sufficient magnitude to preclude the construction at the site, as we presently understand it, are known to exist. The subject site is located within Geologic Hazard Category 31 of the "City of San Diego SEISMIC HAZARD STUDY, Geologic Hazards and Faults". Geologic Hazard Category 31 refers to areas which possess a high potential for soil liquefaction due to such factors as shallow groundwater and the presence of hydraulic fills. A discussion of the results of our detailed analysis of the liquefaction potential at the site is presented below in the Liquefaction section of this report.

**LANDSLIDE POTENTIAL AND SLOPE STABILITY:** As part of this investigation we reviewed the publication, "Landslide Hazards in the Southern Part of the San Diego Metropolitan Area" by Tan, 1995. This reference is a comprehensive study that classifies San Diego County into areas of relative landslide susceptibility. The subject site is located in Area 1. Land within Area 1 is considered to be the least susceptible to slope failures. Based on the absence of significant slopes within the vicinity of the subject site, the potential for slope failures can be considered negligible.

**GROUND SHAKING:** A likely geologic hazard to affect the site is ground shaking as result of movement along one of the major active fault zones mentioned above. The maximum bedrock accelerations that would be attributed to a maximum probable earthquake occurring along the nearest fault segments of selected fault zones that could affect the site are summarized in the following Table I.

TABLE I

Fault Zone	Distance	Max. Magnitude Earthquake	Maximum Bedrock Acceleration
Rose Canyon	1.4 miles	6.9 Magnitude	0.55 g
Coronado Bank	11 miles	7.4 Magnitude	0.30 g
Newport-Inglewood	30 miles	6.9 Magnitude	0.11 g
Elsinore	41 miles	7.1 Magnitude	0.09 g
Earthquake Valley	47 miles	6.5 Magnitude	0.06 g
Palos Verdes	55 miles	7.1 Magnitude	0.08 g
San Jacinto	64 miles	7.2 Magnitude	0.07 g

Probable ground shaking levels at the site could range from slight to moderate, depending on such factors as the magnitude of the seismic event and the distance to the epicenter. It is likely that the site will experience the effects of at least one moderate to large earthquake during the life of the proposed improvements.

**SEISMIC DESIGN PARAMETERS:** Based on a maximum magnitude ( $M_{max}$ ) earthquake of 6.9 along the nearest portion of the Rose Canyon Fault Zone, the Maximum Bedrock Acceleration at the site would be approximately 0.55 g. For structural design purposes, a damping ratio not greater than 5 percent of critical dampening, and Soil Profile Type  $S_E$  are recommended (UBC Table 16-J). Based on the site's location of approximately 4 kilometers from the Rose Canyon Fault Zone (Type B Fault), Near Source Factors  $N_s$  equal to 1.3 and  $N_r$  equal to 1.6 are also applicable. These values, along with other seismically related design parameters from the Uniform Building Code (UBC) 1997 edition, Volume II, Chapter 16, utilizing a Seismic Zone 4 are presented in tabular form below.

TABLE II

UBC – Chapter 16 Table Number	Seismic Design Parameter	Recommended Value
16-I	Seismic Zone Factor Z	0.40
16-J	Soil Profile Type	$S_E$
16-Q	Seismic Coefficient $C_s$	$0.36 N_s$
16-R	Seismic Coefficient $C_r$	$0.96 N_r$
16-S	Near Source Factor $N_s$	1.3
16-T	Near Source Factor $N_r$	1.6
16-U	Seismic Source Type	B

**LIQUEFACTION:** The subject site is in an area considered susceptible to liquefaction. In order to be subject to liquefaction, three conditions must be present: loose sandy deposits of a specified grain-size distribution, shallow groundwater, and earthquake shaking of sufficient magnitude and duration. Based on our site-specific study, it appears that both shallow groundwater is present at the site and strong earthquake shaking may affect the site. Additionally, as described in the Geologic Setting and Soil Description section of this report above, the materials below the shallow water table in the project area consisted of varying layers of silty sand (SM), clayey sand (SC), and slightly clayey sand (SP-SC), all of which are expected to possess grain size distributions conducive to liquefaction. As such, we have evaluated the potential for liquefaction at the site using the LIQUEFY2 computer program, version 1.50 (Blake, 1998).

Our analysis, which was performed in accordance with the procedure recommended by the National Center For Earthquake Engineering Research (NCEER, 1997), incorporates the geotechnical data obtained from the ground surface to 50 feet below existing site grades as observed in our Exploratory Boring B-1. Furthermore, our liquefaction analysis addresses the maximum magnitude ( $M_{max}$ ) seismic event that is considered probable along the nearest portion of the Rose Canyon Fault Zone.

The results of our analysis indicate that an approximately 3-foot-thick layer of saturated, loose, silty sand (SM), which was noted from 14 feet to 17 feet below existing site grades, possesses a factor of safety against soil liquefaction of 0.52 and is therefore considered liquefiable (see Plate No. 14). A three-foot-thick layer of saturated, loose, silty sand (SM), encountered at depth of 21½ feet to 24½ feet below existing site grades, was determined to possess a factor of safety against soil liquefaction of 0.27 and is therefore also considered liquefiable (see Plate No. 15). In addition, a six-foot-thick layer of saturated, medium dense, clayey sand (SC), possessing 21% fines and encountered at a depth of 37 feet to 43 feet below existing site grades, was determined to possess a factor-of-safety against soil liquefaction of 0.57 and is therefore also considered liquefiable (see Plate No. 15). These calculations assume a maximum bedrock acceleration of 0.55 g, based on a maximum magnitude earthquake of 6.9 along the nearest portion of the Rose Canyon fault Zone.

Good engineering practice requires that where the evaluation indicates that liquefaction is likely, the hazards that might reasonably be caused by liquefaction that could result in the collapse of a structure and/or loss of life be mitigated. In our opinion, the foundation recommendations contained in this report address this situation and provide a life-safety performance level for the addition. These recommendations do not, however, preclude the possibility of some structural damage and settlement occurring as a result of a major seismic event.

The estimated liquefaction-induced settlements of the site in its present condition are presented on Plate No. 17. Our analysis indicates that the potential for up to approximately three inches of seismically-induced, total settlement may be expected at the site as the result of soil liquefaction caused by a 6.9 Magnitude seismic event along the nearest portion of the Rose Canyon Fault Zone. As described in the referenced Special Publication 117, considerable difficulty exists in trying to "reliably estimate" the amount of differential settlement at a site caused by soil liquefaction. As such, a conservative estimate of differential settlement at any given site can be assumed to be two-thirds of the total liquefaction-induced settlement (CDMG, 1997). Therefore, the subject site may be assumed to be subject to up to approximately two inches of seismically-induced, differential settlement.

The above analysis is in no way a guarantee that the analysis will accurately predict the liquefaction potential at the site. The analysis provides general information only on the site liquefaction potential. It should be noted that many of the parameters used in liquefaction evaluations are subjective and open to interpretation, and that much is yet unknown about both the seismicity of the San Diego area and the phenomenon of liquefaction.

**LATERAL GROUND SPREADING:** Another concern is the possible lateral ground spreading that could occur at the site. Lateral ground spreading can occur when the viscous liquefied soils flow downslope, usually towards a river channel or shoreline. The project area is located adjacent to Mission Bay and displays a gentle overall downward trend to the northeast, towards Mission Bay. However, based on such factors as the relatively level area of the site, the relatively gentle hydraulic gradient observed within our exploratory borings, the distance of the project from the edge of the bay, and the shallow depth of Mission Bay, it is our opinion that if liquefaction were to occur during an earthquake, the site will likely experience only minor lateral movement towards Mission Bay.

**FLOODING:** As delineated on the referenced Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency, the site is located outside of the boundaries of both the 100-year and 500-year flood zones.

**TSUNAMIS:** Tsunamis are great sea waves produced by submarine earthquakes or volcanic eruptions. Due to the site's setback from the ocean, it is unlikely that the site would be affected by a tsunami.

**SEICHES:** Seiches are periodic oscillations in large bodies of water such as lakes, harbors, bays or reservoirs. Although the site is located adjacent to Mission Bay, due to the size and configuration of Mission Bay, it is our opinion that the risk potential for damage caused by seiches is relatively low.

## SETTLEMENT ANALYSIS

**STATIC SETTLEMENT ANALYSIS:** Based on the subsurface conditions described above and the results of laboratory consolidation tests, we have calculated the amount of settlement for four different loading conditions. The calculations were based on adding loads equivalent to 2.5, 5, 7.5 and 10 feet of fill material above existing grades, with a fill unit weight of 125 pounds per cubic foot. This analysis indicate how much settlement can be expected if the project area is surcharged and/or a concrete mat foundation is used to support the building. Our analysis also considered the removal and recompaction of the upper 12 feet of fill material and assumed that only minimal settlement would occur in this zone if loaded with a surcharge or a mat foundation. Based on this, the table on the following page presents the anticipated settlements that were calculated:

TABLE III

Depth of Fill	Loading Pressure	Anticipated Settlement without recompaction	Anticipated Settlement with 12 feet of recompaction
2.5 feet	312.5 psf	0.8 inches	0.8 inches
5.0 feet	625 psf	3.0 inches	1.4 inches
7.5 feet	937.5 psf	4.1 inches	2.1 inches
10.0 feet	1250 psf	5.0 inches	2.6 inches

If the site can be surcharged and a mat foundation with a contact pressure of 75 percent or less than the surcharge pressure can be used to support the critical structure, we are of the opinion that the static settlement problem can be mitigated.

**DYNAMIC SETTLEMENTS DUE TO LIQUEFACTION:** Based on liquefaction analysis at this site and other sites within the park that we have been involved with, we estimate that, without surcharging, seismically-induced settlements for the site could be on the order of 3 to 4 inches. We estimate that with the anticipated site preparation recommendations and site surcharging, this magnitude of settlement could be reduced by approximately one half, or to about 1.5 inches. Further, we expect that at least one-quarter of this settlement would occur over a wide area. Thus, we estimate that with the surcharging, the differential settlement due to liquefaction-induced settlement could be on the order of one inch. Based on the lenticular nature of the bay deposits, this differential is expected to occur over a distance of about 50 to 100 feet.

One way to mitigate the seismically induced settlements would be to perform deep ground modification such as performing pressure grouting, installing stone columns or some other specialized procedure. Another option would be to support the structure(s) on a pile foundation system. Considering the type of structures anticipated and the depth to dense soils, the preferred alternate to basically eliminate the seismically induced settlements would probably be a deep ground modification operation. This opinion is based on the number of light, settlement-sensitive elements, such as the elevated track, the lakes, and the ride entrance/exit elements around the ride that would also need to be protected.

Based on the preliminary information we provided SeaWorld and their consultants regarding our settlement analysis, we assume that SeaWorld is willing to assume the risks associated with the anticipated seismically-induced settlements discussed above, without the deep ground modification procedures or the use of pile foundations. We have based the site preparation and foundation

recommendations presented herein on this assumption. If this is not the case, we need to be advised immediately.

## CONCLUSIONS

In general, we found that the subject site is suitable to support the proposed splash ride project if the site preparation and foundation recommendations presented herein are strictly adhered to. The main geotechnical and geologic conditions that will impact the development of the subject project include undocumented fill materials that are marginally or poorly compacted, loose or soft, compressible bay deposits extending to a depth of about 35 feet below the surface of the site, relatively shallow groundwater, groundshaking during major seismic events, and liquefiable soils below the water table. Specific recommendations to mitigate these conditions are presented below, and include removal and replacement of the near-surface soils as uniformly compacted fill, construction of a pore water pressure dissipation blanket below critical structures, surcharging areas where settlement-sensitive structures will be constructed, and using concrete mat foundations with relatively light soil bearing pressures. The pore water pressure dissipation blanket and surcharging are only required for the three tower structures, the aquarium exhibit, and the LSS building.

## RECOMMENDATIONS

### GRADING AND EARTHWORK

**GENERAL:** All grading should conform to the guidelines presented in Appendix Chapter A33 of the Uniform building code, the minimum requirements of the City of San Diego, and the Recommended Grading Specifications and Special Provisions attached hereto, except where specifically superseded in the text of this report. Prior to grading, a representative of Christian Wheeler Engineering should be present at the preconstruction meeting to provide additional grading guidelines, if necessary, and to review the earthwork schedule.

**OBSERVATION OF GRADING:** Continuous observation by the Geotechnical Consultant is essential during the mass grading operation to confirm conditions anticipated by our investigation, to allow adjustments in design criteria to reflect actual field conditions exposed, and to determine that the grading proceeds in general accordance with the recommendations contained herein.

**CLEARING AND GRUBBING:** Site grading should begin with the removal of all existing structures and improvements in the project area and all vegetation and other deleterious materials from the portions of site that will be graded and/or will receive improvements. The resulting materials should be disposed of off-site. It is anticipated that some underground utility lines associated with the existing improvements will be encountered in the project area. These lines should be removed from the areas to be graded. There is a storm drain that crossed the project area that will need to be rerouted. The abandoned pipe should be removed and the resulting depressing backfilled with uniformly compacted fill material.

**EXCAVATION CHARACTERISTICS:** Planned excavations and excavations for the removal of unsuitable soils should be able to be accomplished using normal heavy grading equipment. However, it should be noted that oversize construction debris will be encountered in the area approximately delineated on the attached site plan. Some of this material may require special handling due to its size. Further, some debris may be found that will be unsuitable for replacement in structural fills; this material will need to be removed from the site. It can also be noted that our past experience in the park indicates that some very fat, highly plastic clays are sometimes encountered that are not suitable for use as structural fill material.

**SITE PREPARATION:** Site preparation for the various elements of the splash water ride project will basically consist of removal of the existing soils to a specified depth, depending on the type or structure and loading conditions, and replacing the excavated soils as uniformly compacted fill. For some of the more-critical structures, site preparation will include surcharging and construction of a pore water pressure dissipation blanket. The following provides specific recommendations for each of the proposed elements of the project.

**ELEVATOR TOWER, DROP TOWER, STAIR TOWER, AQUARIUM AND LSS**

**BUILDING:** Site preparation for these elements should consist of removing the existing soils to elevation 12 feet SeaWorld Datum and stockpiling the excavated soils for later use as fill material. The minimum lateral limits of the excavations should extend at least ten (10) feet outside the perimeter of the mat foundation systems for the towers and five (5) feet outside the perimeter of the foundations for the aquarium and LSS building. The excavation for the three towers should be connected as indicated on Plate Number 1.

Once the excavations are made, a pore water pressure dissipation blanket should be constructed at the bottom of the excavations. The pore pressure dissipation blankets should be two feet thick and

consist of 3/4-inch crushed rock completely wrapped in filter fabric. The filter fabric should consist of Mirafi 140N or an equivalent product. The blanket should extend at least ten (10) feet outside the perimeter of the mat foundations of the towers and cover the entire excavation limits indicated on the following Figure Number 2. For the aquarium and LSS building, the blankets should extend at least five (5) feet outside the perimeter of the mat foundations. After the first foot of fill material is placed over the blanket, the rock should be densified using a small vibratory compactor similar to vibratory compactors used to compact trench backfill or retaining wall backfill.

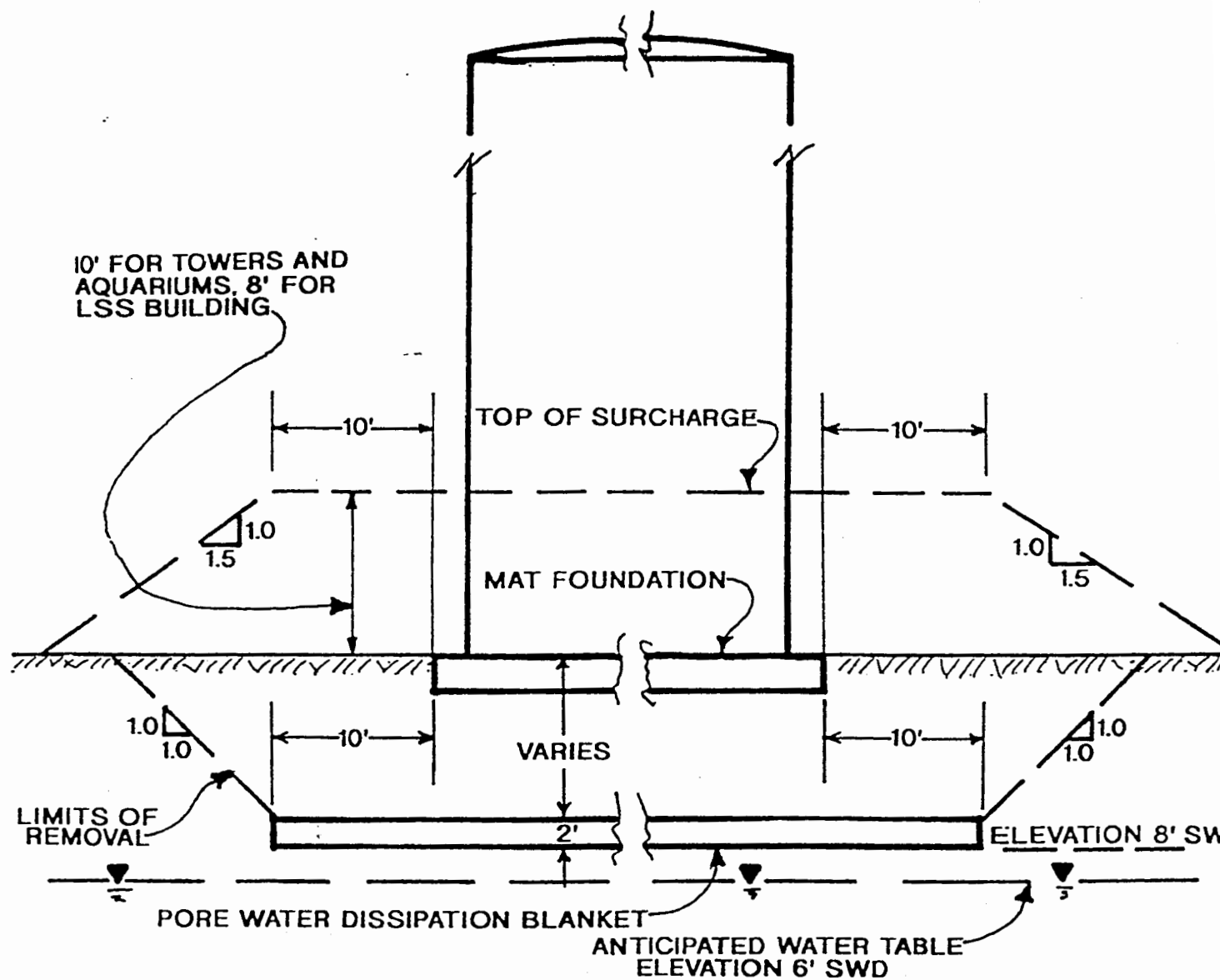
Once the pore water pressure dissipation blankets are constructed, the stockpiled fill material should be replaced in the excavations in accordance with the recommendations presented hereinafter for structural fill material.

After the structural fill material is placed to finish pad grade, additional fill should be placed on the building pads to surcharge the areas. The surcharge should consist of lightly compacted soil placed to a minimum height of ten (10) feet above the finish pad grade. The top edge of the surcharge should match the excavation limits indicated on the following Figure Number 2. The side slopes should be constructed at an inclination of 1.5: (horizontal to vertical). The surcharge should be placed in a continuous operation as rapidly as practical. Once the surcharge is brought up to the proper height, settlement monuments should be placed on the top and monitored at least twice a week until it can be determined that the consolidation process is in the secondary stage. At this point, additional consolidation is considered to be relatively minimal. We anticipate that the surcharge period will take approximately six to eight weeks to reach the secondary consolidation stage.

The detail presented on the following Figure Number 2 summarizes the general limits of the site preparation recommendations presented above. If found necessary, some adjustment of the elevation of the pore pressure dissipation blanket can be made to allow construction of the ride track in the elevator tower area. Such adjustment should be approved by Christian Wheeler Engineering.

**ELEVATED RIDE TRACK:** Site preparation along the elevated track should consist of removal of the existing soils to a depth of at least eight (8) feet below finish grade and replacement of the excavated materials as structural fill. The minimum horizontal limits of this removal should extend at least eight (8) feet outside the edge of the mat foundation system that will support the elevated track. Deeper excavations may, however, be necessary if soils determined by the





DETAIL FOR  
LIMITS OF PORE WATER PRESSURE BLANKET AND  
SURCHARGE FOR DROP TOWER, LIFT TOWER,  
STAIR TOWER, AQUARIUMS AND LSS BUILDING

geotechnical engineer to be unsuitable to support the fill material to be replaced are exposed. The excavation should not extend below the elevation of 12 feet SWD. If excessive pumping is encountered at a depth of eight feet, the bottom of the excavation may need to be stabilized. Specific recommendations should be provided by the geotechnical engineer during site preparation if this condition occur. Prior to replacing the overexcavated soils, the soils exposed at the bottom of the excavation should be processed to receive fill as recommended hereinafter.

**AT-GRADE RIDE CHANNEL AND ARTIFICIAL LAKES:** The existing soils below the at-grade ride channel and the artificial lakes should be removed to a minimum depth of three feet below the bottom of the mat foundations and concrete pool bottoms, and be replaced as structural fill. The minimum horizontal limits of this excavation should extend at least three (3) feet outside the edges of the ride track foundations and lake bottom foundations. If soils considered to be unsuitable to support the fill material to be replaced are exposed at this level, deeper removals may be necessary. Prior to replacing the overexcavated soils, the soils exposed at the bottom of the excavation should be processed to receive fill as recommended hereinafter.

**RIDE WATER FILTER PLANT:** We understand that this element is not considered to be a critical element and, therefore, can tolerate more settlement than the LSS Building. In order to reduce the static settlement to approximately two (2) inches, the upper eight (8) of soil below the bottom of the foundations should be removed and replaced as structural fill. If soils considered to be unsuitable to support the fill material to be replaced are exposed at this level, deeper removals may be necessary. Prior to replacing the overexcavated soils, the soils exposed at the bottom of the excavation should be processed to receive fill as recommended hereinafter.

**SUPPORT FACILITY BUILDING, GIFT SHOP, ENTRY CANOPY AND**

**RESTROOM FACILITY:** The existing soils below these structures should be removed to a minimum depth of six (6) feet below the bottom of the foundations and be replaced as structural fill. The minimum horizontal limits of this excavation should extend at least six (6) feet outside the edges of the perimeter foundations. If soils considered to be unsuitable to support the fill material to be replaced are exposed at this level, deeper removals may be necessary. Prior to replacing the overexcavated soils, the soils exposed at the bottom of the excavation should be processed to receive fill as recommended hereinafter.

**EXTERIOR FLATWORK AREAS:** In all areas that will receive on-grade concrete flat work, the existing soils within two (2) feet of the bottom of the concrete should be removed and be

replaced as structural fill. The minimum horizontal limits of this removal should extend at least two (2) feet outside the edges on the concrete. If soils considered to be unsuitable to support the fill material top be replaced are exposed at this level, deeper removals may be necessary. Prior to replacing the overexcavated soils, the soils exposed at the bottom of the excavation should be processed to receive fill as recommended hereinafter.

**MISCELLANEOUS IMPROVEMENTS:** Any other settlement-sensitive structures or improvements not specifically covered by the above site preparation recommendations should be brought to the attention of the geotechnical engineer. Site-specific recommendations can be provided for the site preparation for such structures and improvements when the particulars of the structures and improvements are known.

It should be realized that a considerable amount of buried construction debris was found to exist in the northwest portion of the subject project. The approximate area where this material is located is indicated on the Site Plan included herewith as Plate No. 1. This area most likely contains oversize materials and possibly other unsuitable materials and trash that will not be suitable for use in structural fills and will need to be exported and properly disposed of off site.

**DEWATERING:** Based on the proposed construction plans, it appears that the excavations will not extend below the water table. However, should it be found that dewatering will be necessary to excavate and construct structures below the water table, a contractor specializing in construction dewatering should be retained to design and perform the necessary dewatering. It is recommended that if dewatering is needed, it be performed as much as possible on a localized basis in order to minimize its impact on adjacent improvements.

**PROCESSING OF FILL AREAS:** Prior to placing any new fill soils or constructing any new improvements in areas that have been cleaned out to receive fill, the exposed soils should be scarified to a depth of 12 inches, moisture conditioned, and compacted to at least 90 percent relative compaction. This procedure is not necessary where the pore water pressure dissipation blankets are constructed. No other special ground preparation is anticipated at this time.

**COMPACTION AND METHOD OF FILLING:** All structural fill placed at the site should be compacted to a relative compaction of at least 90 percent of its maximum dry density as determined by ASTM Laboratory Test D1557-91. Fills should be placed at or slightly above optimum moisture content, in lifts six to eight inches thick, with each lift compacted by mechanical means. Fills should

consist of approved earth material, free of trash or debris, roots, vegetation, or other materials determined to be unsuitable by our soil technicians or project geologist. Fill material should be free of rocks or lumps of soil in excess of twelve inches in maximum dimension. However, in the upper five feet of pad grade, no rocks or lumps of soil in excess of six inches should be allowed.

Utility trench backfill within five feet of the proposed structures and beneath all pavements and concrete flatwork should be compacted to a minimum of 90 percent of its maximum dry density. The upper twelve inches of subgrade beneath paved areas should be compacted to 95 percent of the materials maximum dry density. This compaction should be obtained by the paving contractor just prior to placing the aggregate base material and should not be part of the mass grading requirements or operation.

**SELECT GRADING:** Most of the on-site soils exposed in our subsurface explorations are considered to be nondetrimentally expansive. Nondetrimentally expansive soils are defined herein as soils with an expansion index less than 50. Boring B2 did, however, encounter a six-foot-thick layer of highly expansive clay from three to nine feet below grade. Any expansive soil encountered during grading that is proposed to be used as fill material should be placed at least five (5) feet below finish pad grade, or it should be mixed with other on-site soils to produce a nondetrimentally expansive mixture of soil. Wherever detrimentally expansive soil is determined to occur naturally within five feet of finish pad grade in cut or ungraded areas, it should be removed and replaced with nondetrimentally expansive material.

**IMPORTED FILL MATERIAL:** At this time, the need to import fill material has not been determined. If imported fill is necessary, it should be evaluated and approved by the Geotechnical Consultant prior to being imported. At least two working days notice of a potential import source should be given to the Geotechnical Consultant so that appropriate testing can be accomplished. The type of material considered most desirable for import is a nondetrimentally expansive granular material with some silt or clay binder. Further, the import material should have no more than 25 percent finer than the standard No. 200 sieve size, no rock larger than six inches and no more than 20 percent larger than the standard No. 4 sieve size.

**FILL SLOPE CONSTRUCTION:** Fill slopes may be constructed at an inclination of 2:1 or flatter (horizontal to vertical). Compaction of slopes should be performed by back-rolling with a sheepfoot compactor at vertical intervals of four feet or less as the fill is being placed, and track-walking the face of the slope when the slope is completed. As an alternative, the fill slopes may be overfilled by at least

three feet and then cut back to the compacted core at the design line and grade. Keys should be made at the toe of fill slopes in accordance with the recommendations presented above under "Compaction and Method of Filling."

**SURFACE DRAINAGE:** Surface runoff into ungraded areas should be minimized. Where possible, drainage should be directed to suitable disposal areas via non-erodible devices such as paved swales, gunited brow ditches, and storm drains. Pad drainage should be designed to collect and direct surface water away from proposed structures and the top of slopes and toward approved drainage areas. For earth areas, a minimum gradient of one percent should be maintained.

The ground around the proposed buildings should be graded so that surface water flows rapidly away from the buildings without ponding. In general, we recommend that the ground adjacent to buildings slope away at a gradient of at least two percent. Densely vegetated areas where runoff can be impaired should have a minimum gradient of five percent within the first five feet from the structure.

#### **SLOPE STABILITY**

**GENERAL:** All slopes at the subject development will be constructed at a slope ratio of 2:0 horizontal units to 1.0 vertical unit (2:1) or flatter. Maximum cut and fill slope heights will be less than about 10 feet. Based on the relatively high strength parameters of the on-site granular soils, it is our opinion that the proposed slopes will be stable in regards to deep-seated slope failure and surficial slope failure. The proposed slopes will have a factor of safety against failure in excess of the normally required minimum safety factor of 1.5. All fill slopes should be constructed in accordance with the grading recommendations presented above.

**EROSION CONTROL:** The placement of cohesionless soils at the face of slopes should be avoided. Slopes should be planted as soon as feasible after grading. Sloughing, deep rilling and slumping of surficial soils may be anticipated if slopes are left unplanted for a long period of time, especially during the rainy season. Irrigation of slopes should be carefully monitored to insure that only the minimum amount necessary to sustain plant life is used. Over-irrigating could be extremely erosive and should be avoided.

#### **FOUNDATION RECOMMENDATIONS**

**GENERAL:** Based on the findings of our investigation and consultation with the project structural engineer, architect and SeaWorld design team, it was determined that the three towers should be

supported by full concrete mat foundations, while the other less settlement-sensitive structures may be supported by partial concrete mat foundations or, in the case of the rest room facility, by conventional spread footings. The successful performance of such foundations will, however, depend on the building pads being prepared are recommended above in the Grading and Earthwork section of this report. The following provides specific recommendations for the full and partial concrete mat foundations and for conventional spread footings for some of the miscellaneous improvements.

## CONCRETE MAT FOUNDATIONS

**GENERAL:** It is recommended that full concrete mat foundations be used to support the three tower structures, the aquarium tanks and the LSS building. Partial concrete mat foundations should be used to support the remaining structures, including the elevated track, the tracks in the at-grade water channels, the entry canopy, the retail store, and the facility support building. The static foundation contact pressure for the full mat foundations should not exceed 950 pounds per square foot. The static foundation contact pressure for the partial mat foundations should not exceed 350 pounds per square foot. For the at-grade water channels, the static foundation contact pressure should not exceed 600 pounds per square foot. The mat foundations may be designed using a subgrade modulus of 200 pounds per cubic inch. The thickness and structural reinforcing requirements of the mat foundations should be provided by the project structural engineer.

**ANTICIPATED SETTLEMENTS:** Where the surcharge operation is performed, the static foundation contact pressure of the mat foundations will be approximately 75 percent of the surcharge pressure. Therefore, the anticipated static settlement is expected to be less than about one-quarter inch. This includes the three towers, the aquarium and the LSS building. The dynamic settlement caused by liquefaction during a major seismic event in the areas that have been surcharged is estimated to be approximately one inch. A differential settlement due to liquefaction is estimated to be roughly one inch, over a distance of between 50 to 100 feet.

The anticipated static settlement for the ride water filter plant is estimated to be approximately two inches. The dynamic settlement caused by liquefaction during a major seismic event in the area that could cause liquefaction is estimated to be roughly two inches, over a distance of between 50 to 100 feet.

The anticipated static settlements for the rest of the above-grade structures are estimated to be less than one inch. The dynamic settlement caused by liquefaction during a major seismic event in the

areas that have not been surcharged is estimated to be approximately three inches. Differential settlement due to liquefaction is estimated to be roughly two inches, over a distance of between 50 to 100 feet.

## CONVENTIONAL FOUNDATIONS

**GENERAL:** Conventional spread footings for light structures, such as the restroom facility and other miscellaneous improvements, should be embedded at least 18 inches below finish pad grade. Continuous and isolated footings should have a minimum width of 12 inches and 18 inches, respectively. This assumes that the soils within the foundation influence depth zone are properly compacted. The foundation influence depth zone is defined herein as a depth of three times the width of continuous footings and 1.5 times the width of isolated footings.

**BEARING CAPACITY:** Conventional spread footings with the above minimum dimensions may be designed for an allowable soil bearing pressure of 2000 pounds per square foot. This value may be increased by one-third for combinations of temporary loads such as those due to wind or seismic loads.

**FOOTING REINFORCING:** Reinforcement requirements for foundations should be provided by a structural engineer. However, based on the anticipated soil conditions after site preparation, we recommend that the minimum reinforcing for continuous footings consist of at least one No. 5 bar positioned three inches above the bottom of the footing and one No. 5 bar positioned approximately two inches below the top of the footing.

**LATERAL LOAD RESISTANCE:** Lateral loads against foundations may be resisted by friction between the bottom of the footing and the supporting soil, and by the passive pressure against the footing. The coefficient of friction between concrete and soil may be considered to be 0.35. The passive resistance may be considered to be equal to an equivalent fluid weight of 350 pounds per cubic foot. This assumes the footings are poured tight against undisturbed soil. If a combination of the passive pressure and friction is used, the friction value should be reduced by one-third.

**FOUNDATION EXCAVATION OBSERVATION:** All foundation excavations should be observed by the Geotechnical Consultant prior to placing concrete to determine if the foundation recommendations presented herein are complied with. All footing excavations should be

excavated neat, level and square. All loose or unsuitable material should be removed prior to the placement of concrete.

## **ON-GRADE SLABS**

**INTERIOR SLABS:** The interior slabs for buildings that will support heavy equipment loads should be designed by the project structural engineer. The minimum slab thickness for conventional slabs should be five inches. Interior slabs should be reinforced with at least No. 3 bars placed at 12 inches on center each way. The slab reinforcing bars should extend into the perimeter footings as required by the structural engineer. Slab reinforcing should be positioned on chairs at mid-height in the floor slab.

**MOISTURE PROTECTION FOR INTERIOR SLABS:** Interior concrete on-grade slabs that will support moisture-sensitive floor coverings should be underlain by a moisture barrier. We recommend that the minimum configuration of the subslab moisture barrier consist of a four-inch-thick blanket of coarse, clean sand and a visqueen vapor barrier. The sand should have 100 percent material passing the 1/4-inch sieve and less than ten percent and five percent passing the No. 100 and No. 200 sieves, respectively. The visqueen vapor barrier should have a minimum thickness of 10 mil and should be placed in the center of the sand blanket.

**EXTERIOR CONCRETE FLATWORK:** Exterior slabs should have a minimum thickness of four inches. Reinforcement should be placed in exterior concrete flatwork to reduce the potential for cracking and movement. Control joints should be placed in exterior concrete flatwork to help control the location of shrinkage cracks. Spacing of control joints should be in accordance with the American Concrete Institute specifications. When patio, walks and porch slabs abut perimeter foundations they should be doweled into the footings.

## **EARTH RETAINING WALLS**

**BEARING CAPACITY:** The bearing capacity of retaining walls will be dependent on the compaction of the supporting soils. Assuming that the soils for a depth of at least 1.5 times the width of the footing are removed and replaced as compacted fill, it is our opinion that such foundations may be designed using an allowable soil bearing pressure of 2000 pounds per square foot. This pressure may be increased by one-third for temporary loading.



**PASSIVE PRESSURE:** The passive pressure for the prevailing soil conditions may be considered to be 350 pounds per square foot per foot of depth. This pressure may be increased one-third for seismic loading. The coefficient of friction for concrete to soil may be assumed to be 0.35 for the resistance to lateral movement. When combining frictional and passive resistance, the friction should be reduced by one-third. The upper 12 inches of exterior retaining wall footings should not be included in passive pressure calculations where abutted by landscaped areas.

**ACTIVE PRESSURE:** The active soil pressure for the design of unrestrained earth retaining structures with level backfill may be assumed to be equivalent to the pressure of a fluid weighing 35 pounds per cubic foot. An additional 13 pounds per cubic foot should be added to this value for 2:1 (horizontal to vertical) sloping backfill. These pressures do not consider any other surcharge. If any are anticipated, this office should be contacted for the necessary increase in soil pressure. These values assume a drained backfill condition. Waterproofing details should be provided by the project architect. A suggested wall subdrain detail is provided on the attached Plate Number 26. We recommend that the Geotechnical Consultant be retained to observe all retaining wall subdrains to verify proper construction.

**BACKFILL:** All backfill soils should be compacted to at least 90 percent relative compaction. Expansive or clayey soils should not be used for backfill material. The wall should not be backfilled until the masonry has reached an adequate strength.

## LIMITATIONS

### REVIEW, OBSERVATION AND TESTING

The recommendations presented in this report are contingent upon our review of final plans and specifications. Such plans and specifications should be made available to the Geotechnical Engineer and Engineering Geologist so that they may review and verify their compliance with this report and with Appendix Chapter A33 of the Uniform Building Code.

It is recommended that Christian Wheeler Engineering be retained to provide continuous soil engineering services during the earthwork operations. This is to verify compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to start of construction.

## UNIFORMITY OF CONDITIONS

The recommendations and opinions expressed in this report reflect our best estimate of the project requirements based on an evaluation of the subsurface soil conditions encountered at the subsurface exploration locations and on the assumption that the soil conditions do not deviate appreciably from those encountered. It should be recognized that the performance of the foundations and/or cut and fill slopes may be influenced by undisclosed or unforeseen variations in the soil conditions that may occur in the intermediate and unexplored areas. Any unusual conditions not covered in this report that may be encountered during site development should be brought to the attention of the Geotechnical Engineer so that he may make modifications if necessary.

## CHANGE IN SCOPE

This office should be advised of any changes in the project scope or proposed site grading so that we may determine if the recommendations contained herein are appropriate. It should be verified in writing if the recommendations are found to be appropriate for the proposed changes or our recommendations should be modified by a written addendum.

## TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they are due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Government Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a period of two years without a review by us verifying the suitability of the conclusions and recommendations.

## PROFESSIONAL STANDARD

In the performance of our professional services, we comply with that level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions and in the same locality. The client recognizes that subsurface conditions may vary from those encountered at the locations where our borings, surveys, and explorations are made, and that our data, interpretations, and recommendations are based solely on the information obtained by us. We will be responsible for those data, interpretations, and recommendations, but shall not be responsible for the interpretations by

others of the information developed. Our services consist of professional consultation and observation only, and no warranty of any kind whatsoever, express or implied, is made or intended in connection with the work performed or to be performed by us, or by our proposal for consulting or other services, or by our furnishing of oral or written reports or findings.

#### CLIENT'S RESPONSIBILITY

It is the responsibility of SeaWorld, or their representatives to ensure that the information and recommendations contained herein are brought to the attention of the structural engineer and architect for the project and incorporated into the project's plans and specifications. It is further their responsibility to take the necessary measures to insure that the contractor and his subcontractors carry out such recommendations during construction.

#### FIELD EXPLORATIONS

Four subsurface explorations were made at the locations indicated on the Site Plan included herewith as Plate Number 1 on July 6 and 7, 2000. These explorations consisted of borings drilled with a truck-mounted drill rig. The fieldwork was conducted under the observation and direction of our engineering geology personnel.

The explorations were carefully logged when made. The boring logs are presented on the following Plate Numbers 2 through 9. The soils are described in accordance with the Unified Soils Classification. In addition, a verbal textural description, the wet color, the apparent moisture and the density or consistency are provided. The density of granular soils is given as either very loose, loose, medium dense, dense or very dense. The consistency of silts or clays is given as either very soft, soft, medium stiff, stiff, very stiff, or hard.

Undisturbed samples of typical and representative soils were obtained and returned to the laboratory for testing. The undisturbed samples were obtained by driving a 2 and 3/8-inch inside diameter split-tube sampler ahead of the auger using a 140-pound weight free-falling a distance of 30 inches. The number of blows required to drive the sampler each foot was recorded and this value is presented on the attached boring logs as "Penetration Resistance." Bulk samples of disturbed soil and undisturbed chunk samples were also collected in bags from the auger cuttings during the advancement of the borings and from the test trench excavations and returned to the laboratory for testing.

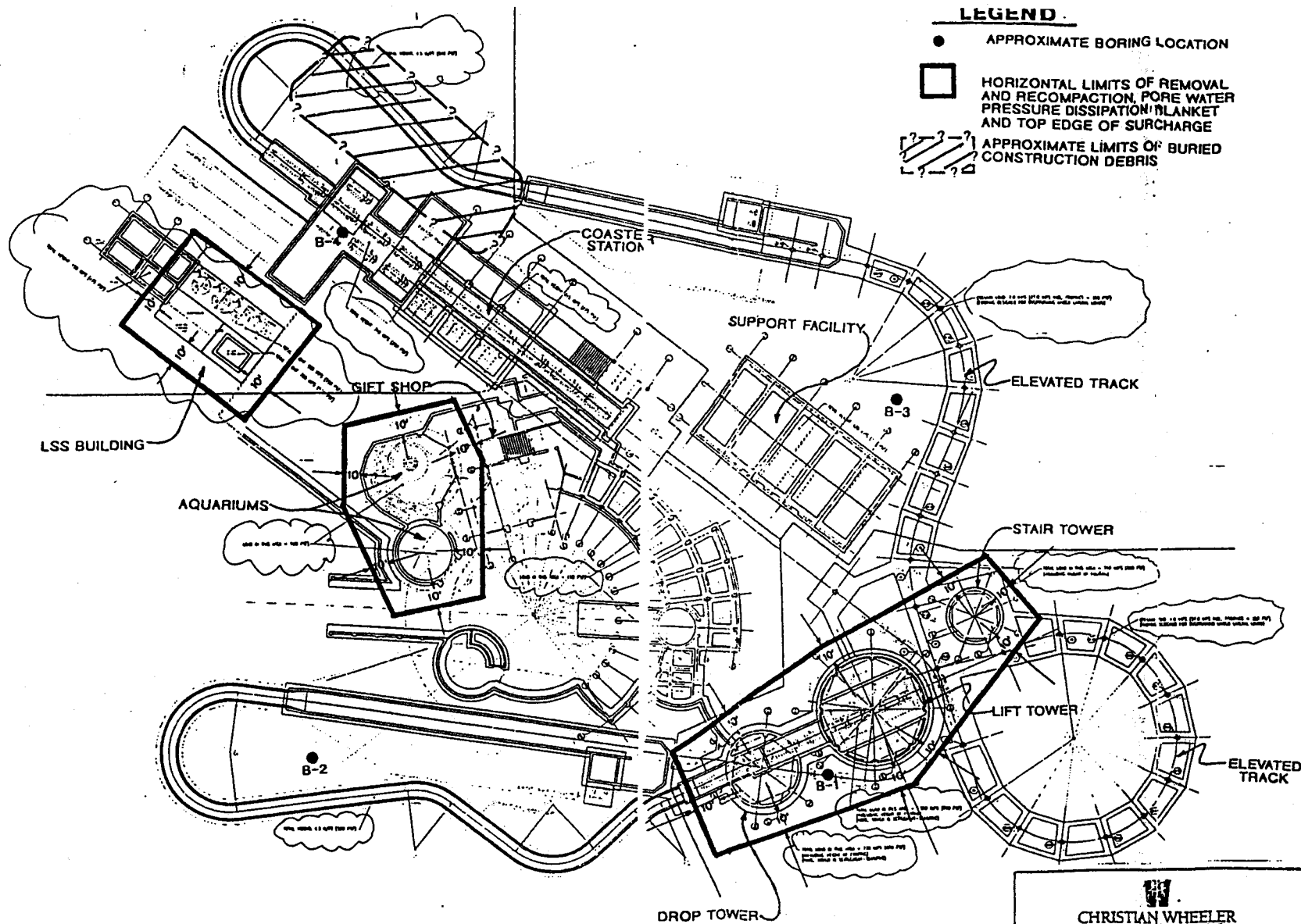
## LABORATORY TESTING

Laboratory tests were performed in accordance with the generally accepted American Society for Testing and Materials (ASTM) test methods or suggested procedures. A brief description of the tests performed is presented below.

- a) **CLASSIFICATION:** Field classifications were verified in the laboratory by visual examination. The final soil classifications are in accordance with the Unified Soil Classification System.
- b) **MOISTURE-DENSITY:** In-place moisture contents and dry densities were determined for representative soil samples. This information was an aid to classification and permitted recognition of variations in material consistency with depth. The dry unit weight is determined in pounds per cubic foot, and the in-place moisture content is determined as a percentage of the soil's dry weight. The results of these tests are summarized in the boring logs.
- c) **GRAIN SIZE DISTRIBUTION:** The grain size distribution was determined for selected representative sample of the fill and bay deposits in accordance with ASTM D422. The results of this test are presented on Plate Numbers 18 and 19.
- d) **MAXIMUM DENSITY/OPTIMUM MOISTURE CONTENT:** The maximum dry density and optimum moisture content of one of the typical on-site soil samples was determined in the laboratory in accordance with ASTM Standard Test D-1557-91. The results of these tests are presented on Plate Number 18.
- e) **DIRECT SHEAR TEST:** Direct shear tests were performed to determine the failure envelope based on yield shear strength. The shear box was designed to accommodate a sample having a diameter of 2.375 inches or 2.50 inches and a height of 1.0 inch. Samples were tested at different vertical loads and a saturated moisture content. The shear stress was applied at a constant rate of strain of approximately 0.05 inch per minute. The results of these tests are presented on the attached Plate Number 19.
- f) **EXPANSION INDEX TEST:** An Expansion Index test was performed on a representative sample of clayey soil likely to be present at finish grade. The test was performed on the portion of the sample passing the #4 standard sieve. The sample was

brought to optimum moisture content and then dried back to a constant moisture content for 12 hours at  $230 \pm 9$  degrees Fahrenheit. The specimen was then compacted in a 4-inch-diameter mold in two equal layers by means of a tamper, then trimmed to a final height of 1 inch, and brought to a saturation of approximately 50 percent. The specimen was placed in a consolidometer with porous stones at the top and bottom, a total normal load of 12.63 pounds was placed (144.7 psf), and the sample was allowed to consolidate for a period of 10 minutes. The sample was allowed to become saturated, and the change in vertical movement was recorded until the rate of expansion became nominal. The Expansion Index determined is reported on the attached Plate Number 18 as the total vertical displacement times the fraction of the sample passing the #4 sieve times 1000.

- g) **CONSOLIDATION TEST:** Consolidation tests were performed on selected "undisturbed" samples. The consolidation apparatus was designed to accommodate a 1-inch-high by 2.375-inch or 2.500-inch diameter soil sample laterally confined by a brass ring. Porous stones were placed in contact with the top and bottom of the sample to permit the addition of pore fluid during testing. Loads were applied to the sample in a geometric progression, after vertical movement ceased, resulting deformations were recorded. The percent consolidation is reported as the ratio of the amount of vertical compression to the original sample height. The test sample was inundated at some point in the test cycle to determine its behavior under the anticipated loads as soil moisture increases. In addition, at a selected vertical load, time versus settlement was recorded to determine the time rate characteristics of the soil. The results of the consolidation and time rate tests are presented in the form of a curve on Plate Numbers 20 through 25.



A1  
R10

FOUNDATION LOADS  
FOUNDATION PLAN  
V-1-1

# LEGEND

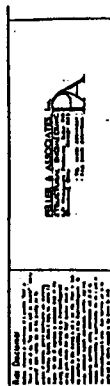
- APPROXIMATE BORING LOCATION
- HORIZONTAL LIMITS OF REMOVAL AND RECOMPACTION, PORE WATER PRESSURE DISSIPATION BLANKET AND TOP EDGE OF SURCHARGE
- ▨ APPROXIMATE LIMITS OF BURIED CONSTRUCTION DEBRIS

CHRISTIAN WHEELER  
ENGINEERING

## ATLANTIS PROJECT

BY: CHC/HC DATE: OCT 16, 2000

JOB NO: 200.338 PLATE NO: 1



Peckham  
Guyton  
Albers & Viets  
INC.

FOUNDATION PLAN  
FOUNDATION LOADS  
2003 Expansion  
SeaWorld San Diego  
Busch Entertainment Corporation  
S1.01

200.338

## LOG OF TEST BORING NUMBER B-1

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 20.5 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 14 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
2		<u>Artificial Fill (Qaf)</u> : Dark brown, moist, medium dense, fine to medium grained, SILTY SAND (SM), slightly micaceous. (to 2½ feet)	US		35	11.5	120.7	MD DS
4		Light brown, fine to medium grained POORLY GRADED SAND (SP), moist, loose to medium dense, micaceous.	US		18	5.4	92.0	
6		Grades to gray in color, becomes dry to damp, medium dense to dense, slight gravels to 1".						
8			US		55	1.8	96.6	
10								
12		<u>Bay Deposits (Qbd)</u> : Black, fine to medium grained SILTY SAND (SM), moist to wet, loose, micaceous.						
14	▽	Becomes saturated at 14 feet. * No ring recovery.	US*		14			
16								
18		Black, fine grained SILTY CLAYEY SAND (SC), saturated, loose, very micaceous.						
20			SPT		4			SA

Continued on Plate No. 3.

  
**CHRISTIAN WHEELER**  
 ENGINEERING

**ATLANTIS PROJECT**  
**SEA WORLD DRIVE, SAN DIEGO, CALIFORNIA**

BY: HC	DATE: October 16, 2000
JOB NO.: 200.338	PLATE NO.: 2

# LOG OF TEST BORING NUMBER B-1 (continued)

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 20.5 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 14 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
		Black, SILTY CLAYEY SAND (SC), saturated, loose.						
22		Black, fine to medium grained SILTY SAND (SM), saturated, loose, very micaceous.	US		7			CS
24		Black, fine grained CLAYEY SAND-SANDY CLAY (SC-CL), saturated, very loose/very soft, slightly micaceous.	SPT		3			SA
26								
28								
30		Dark gray, fine grained SILTY SAND-SANDY SILT (SM-ML), saturated, medium dense, micaceous.	US SPT		24 14			CS SA
32								
34			SPT		12			
36								
38		Dark gray, fine to coarse grained CLAYEY SAND (SC), saturated, medium dense, abundant shell fragments, micaceous.						
40			US		19			CS

Continued on Plate No. 4.

  
 CHRISTIAN WHEELER  
 ENGINEERING

ATLANTIS PROJECT  
 SEA WORLD DRIVE, SAN DIEGO, CALIFORNIA

BY: HC	DATE: October 16, 2000
JOB NO.: 200.338	PLATE NO.: 3



## LOG OF TEST BORING NUMBER B-1 (continued)

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 20.5 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 14 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
42		Dark gray, fine to coarse grained CLAYEY SAND (SC), saturated, medium dense, abundant shell framens.	SPT		17			SA
44		Becomes medium dense to dense, decreasing shell fragments, trace gravels.						
46			US		48			DS
48		Gray, fine to coarse grained, CLAYEY SAND-POORLY GRADED SAND (SC-SP), saturated, dense to very dense, slight gravels.	SPT		63			SA
50		Boring Terminated at 50 feet. Groundwater encountered at 14 feet.						

  
**CHRISTIAN WHEELER**  
 ENGINEERING

**ATLANTIS PROJECT**  
**SEA WORLD DRIVE, SAN DIEGO, CALIFORNIA**

BY: HC

DATE: October 16, 2000






JOB NO.: 200.338

PLATE NO.: 4

## LOG OF TEST BORING NUMBER B-2

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 21.5 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 14 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
2		<u>Fill (Qaf)</u> : Dark brown, moist, medium dense, fine to medium grained SILTY SAND (SM).	US		49	10.4	116.5	
4		Dark gray, moist, medium stiff, SILTY CLAY (CL), very micaceous.	US		12			DS PI
10		Light gray, moist, medium dense, fine to medium grained POORLY GRADED SAND (SP), micaceous.	US		16	3.5	96.2	
14		At 14 feet becomes saturated.	US		29	18.8	96.8	
18		<u>Bay Deposits (Obd)</u> : Black and light gray, saturated, soft to loose, alternating layers (up to 6 inches thick) of SILTY CLAY (CL), with abundant organic debris and fine to medium grained POORLY GRADED SAND (SP).	US		8	44.0	76.2	
20								

Boring terminated at 20 feet.

  
 CHRISTIAN WHEELER  
 ENGINEERING

SEA WORLD ATLANTIS PROJECT  
 500 Sea World Drive, San Diego

BY: HC	DATE: October 16, 2000
JOB NO.: 200.338	PLATE NO.: 5

## LOG OF TEST BORING NUMBER B-3

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 17 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 12 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
2		<u>Fill (Qaf)</u> : Medium brown, moist, medium dense, fine to medium grained SILTY SAND (SM), occasional gravels to 2 inches.	US		36	13.4	109.4	
4		Light brown, moist, medium dense, fine to coarse grained POORLY GRADED SAND (SP), abundant shell fragments.	US		32			DS
6								
8								
10			US		41	20.3	96.2	
12								
14		<u>Bay Deposits (Qbd)</u> : Black, moist, medium stiff, SILTY CLAY (CL), micaceous, slight organic debis. At 13 feet becomes saturated.						
16		Dark, saturated, loose to medium dense, fine to medium grained SILTY SAND (SM), micaceous.	US		17	30.5	87.2	
18								
20			US		15			

Boring continued on Plate 7.

  
 CHRISTIAN WHEELER  
 ENGINEERING

SEA WORLD ATLANTIS PROJECT

500 Sea World Drive, San Diego

BY: HC	DATE: October 16, 2000
JOB NO.: 200.338	PLATE NO.: 6

## LOG OF TEST BORING NUMBER B-3 (continued)

Date Excavated: 7/6/00

Equipment: IR-A300

Surface Elevation: 17 feet SWD

Hammer Weight: 140 lbs

Logged by: DRR

Project Manager: CHC

Depth to Water: 12 feet

Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
22		Dark, saturated, loose to medium dense, fine to medium grained SILTY SAND (SM), micaceous.						
24			SPT		24			
26			US		14	29.5	94.2	
28		Black, saturated, loose to medium dense, fine to medium grained CLAYEY SAND (SC), micaceous.	US		17			
30		Black, saturated, very soft, SANDY SILTY CLAY (CL).	SPT		2			PI
32								HA
34		Black, saturated, loose to medium dense, fine to medium grained CLAYEY SAND (SC), slight shell fragments.	SPT		10			
36								
38		Gray, saturated, medium dense, fine to coarse grained POORLY GRADED SAND (SP).	US		36	16.3	117.2	
40								

Boring continued on Plate 8.



CHRISTIAN WHEELER  
ENGINEERING

### SEA WORLD ATLANTIS PROJECT

500 Sea World Drive, San Diego

BY: HC

DATE: October 16, 2000

JOB NO.: 200.338

PLATE NO.: 7

## LOG OF TEST BORING NUMBER B-3 (continued)

Date Excavated: 7/6/00  
 Equipment: IR-A300  
 Surface Elevation: 17 feet SWD  
 Hammer Weight: 140 lbs

Logged by: DRR  
 Project Manager: CHC  
 Depth to Water: 12 feet  
 Drop of Hammer: 30 inches

DEPTH (ft)	GRAPHIC LOG	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES		PENETRATION (blows/ ft. of drive)	MOISTURE (%)	DRY UNIT WT. (pcf)	LABORATORY TESTS
			SAMPLE TYPE	BULK				
42		Gray, saturated, medium dense, fine to coarse grained POORLY GRADED SAND (SP).	SPT		20			
44								
46		At 45 feet becomes dense.	SPT		35			
48								
50			US		50/5"	13.0	119.0	
52		Boring terminated at 50 feet.						
54								
56								
58								
60								



CHRISTIAN WHEELER  
ENGINEERING

### SEA WORLD ATLANTIS PROJECT

500 Sea World Drive, San Diego

BY: HC	DATE: October 16, 2000
JOB NO.: 200.338	PLATE NO.: 8

-----  
EQFAULT SUMMARY  
-----

-----  
DETERMINISTIC SITE PARAMETERS  
-----

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)		ESTIMATED MAX. EARTHQUAKE EVENT		
			MAXIMUM EARTHQUAKE MAG. (Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
ROSE CANYON	1.4(	2.3)	6.9	0.549	X
CORONADO BANK	11.1(	17.9)	7.4	0.296	IX
NEWPORT-INGLEWOOD (Offshore)	29.5(	47.4)	6.9	0.110	VII
ELSINORE-JULIAN	41.3(	66.5)	7.1	0.094	VII
ELSINORE-TEMECULA	44.1(	71.0)	6.8	0.076	VII
EARTHQUAKE VALLEY	47.3(	76.2)	6.5	0.062	VI
ELSINORE-COYOTE MOUNTAIN	52.2(	84.0)	6.8	0.067	VI
PALOS VERDES	54.6(	87.9)	7.1	0.076	VII
ELSINORE-GLEN IVY	61.1(	98.3)	6.8	0.059	VI
SAN JACINTO-COYOTE CREEK	63.5(	102.2)	6.8	0.058	VI
SAN JACINTO-ANZA	63.6(	102.3)	7.2	0.071	VI
SAN JACINTO - BORREGO	67.2(	108.2)	6.6	0.050	VI
SAN JACINTO-SAN JACINTO VALLEY	69.8(	112.3)	6.9	0.056	VI
NEWPORT-INGLEWOOD (L.A.Basin)	70.8(	114.0)	6.9	0.056	VI
CHINO-CENTRAL AVE. (Elsinore)	74.6(	120.0)	6.7	0.059	VI
SUPERSTITION MTN. (San Jacinto)	77.5(	124.8)	6.6	0.044	VI
LAGUNA SALADA	78.3(	126.0)	7.0	0.054	VI
WHITTIER	78.9(	127.0)	6.8	0.049	VI
COMPTON THRUST	80.1(	128.9)	6.8	0.059	VI
ELMORE RANCH	81.9(	131.8)	6.6	0.043	VI
SUPERSTITION HILLS (San Jacinto)	82.6(	132.9)	6.6	0.042	VI
ELYSIAN PARK THRUST	84.8(	136.5)	6.7	0.053	VI
SAN JACINTO-SAN BERNARDINO	86.5(	139.2)	6.7	0.043	VI
SAN ANDREAS - Southern	88.0(	141.6)	7.4	0.061	VI
SAN ANDREAS - San Bernardino	88.0(	141.6)	7.3	0.058	VI
SAN ANDREAS - Coachella	90.5(	145.6)	7.1	0.051	VI
PINTO MOUNTAIN	94.1(	151.4)	7.0	0.047	VI
BURNT MTN.	95.4(	153.6)	6.4	0.034	V
SAN JOSE	95.8(	154.1)	6.5	0.043	VI
BRAWLEY SEISMIC ZONE	97.1(	156.3)	6.4	0.034	V
IMPERIAL	97.1(	156.3)	7.0	0.046	VI
EUREKA PEAK	98.0(	157.7)	6.4	0.033	V
CUCAMONGA	98.4(	158.3)	7.0	0.055	VI
SIERRA MADRE	98.4(	158.4)	7.0	0.055	VI

\*\*\*\*\*

-----  
EQFAULT SUMMARY  
-----

-----  
DETERMINISTIC SITE PARAMETERS  
-----

-END OF SEARCH - 34 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ROSE CANYON FAULT IS CLOSEST TO THE SITE.

IT IS ABOUT 1.4 MILES (2.3 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.5495 g

```

*****
*
*      L I Q U E F Y 2
*
*      Version 1.50
*
*****

```

EMPIRICAL PREDICTION OF  
EARTHQUAKE-INDUCED LIQUEFACTION POTENTIAL

JOB NUMBER: 200.338... DATE: 10-16-2000

JOB NAME: Atlantis Project

SOIL-PROFILE NAME: atlantis1.LDW

BORING GROUNDWATER DEPTH: 14.00 ft

CALCULATION GROUNDWATER DEPTH: 14.00 ft

DESIGN EARTHQUAKE MAGNITUDE: 6.90 Mw

SITE PEAK GROUND ACCELERATION: 0.550 g

BOREHOLE DIAMETER CORRECTION FACTOR: 1.15

SAMPLER SIZE CORRECTION FACTOR: 1.00

N60 HAMMER CORRECTION FACTOR: 1.00

MAGNITUDE SCALING FACTOR METHOD: Idriss (1997, in press)

Magnitude Scaling Factor: 1.238

rd-CORRECTION METHOD: NCEER (1997)

FIELD SPT N-VALUES ARE CORRECTED FOR THE LENGTH OF THE DRIVE RODS.

Rod Stick-Up Above Ground: 3.0 ft

CN NORMALIZATION FACTOR: 1.044 tsf

MINIMUM CN VALUE: 0.6



NCEER [1997] Method

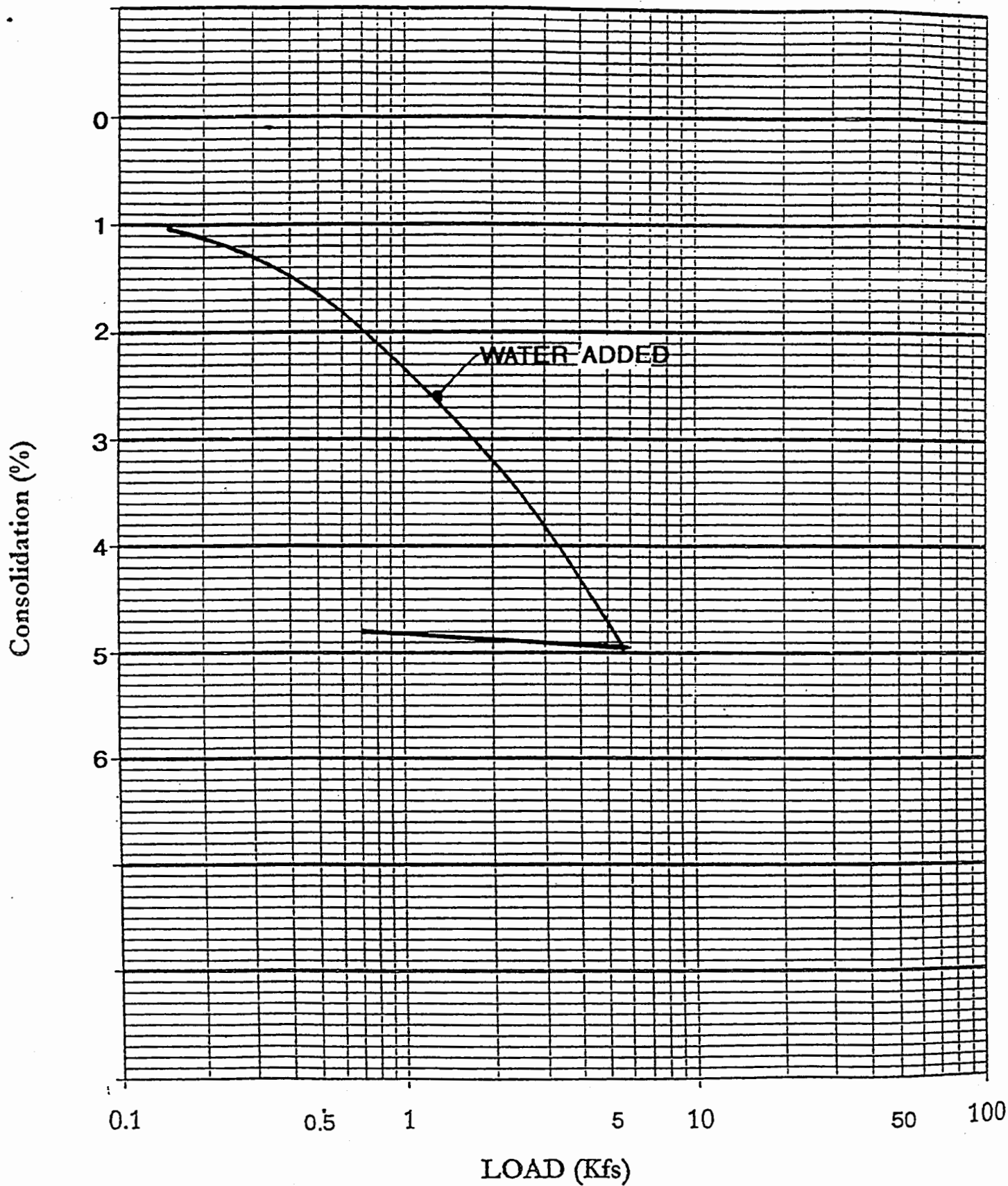
LIQUEFACTION ANALYSIS SUMMARY

File Name: DRR.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
1	0.25	0.015	0.015	22	-	*	*	*	*	*	**
1	0.75	0.045	0.045	22	-	*	*	*	*	*	**
1	1.25	0.075	0.075	22	-	*	*	*	*	*	**
1	1.75	0.105	0.105	22	-	*	*	*	*	*	**
1	2.25	0.135	0.135	22	-	*	*	*	*	*	**
2	2.75	0.165	0.165	11	0.02	*	*	*	*	*	**
2	3.25	0.195	0.195	11	0.02	*	*	*	*	*	**
2	3.75	0.225	0.225	11	0.02	*	*	*	*	*	**
2	4.25	0.255	0.255	11	0.02	*	*	*	*	*	**
2	4.75	0.285	0.285	11	0.02	*	*	*	*	*	**
2	5.25	0.315	0.315	11	0.02	*	*	*	*	*	**
2	5.75	0.345	0.345	11	0.02	*	*	*	*	*	**
2	6.25	0.375	0.375	11	0.02	*	*	*	*	*	**
2	6.75	0.405	0.405	11	0.02	*	*	*	*	*	**
3	7.25	0.435	0.435	34	0.05	*	*	*	*	*	**
3	7.75	0.465	0.465	34	0.05	*	*	*	*	*	**
3	8.25	0.495	0.495	34	0.05	*	*	*	*	*	**
3	8.75	0.525	0.525	34	0.05	*	*	*	*	*	**
3	9.25	0.555	0.555	34	0.05	*	*	*	*	*	**
3	9.75	0.585	0.585	34	0.05	*	*	*	*	*	**
3	10.25	0.615	0.615	34	0.05	*	*	*	*	*	**
3	10.75	0.645	0.645	34	0.05	*	*	*	*	*	**
3	11.25	0.675	0.675	34	0.05	*	*	*	*	*	**
4	11.75	0.705	0.705	8	5.29	*	*	*	*	*	**
4	12.25	0.735	0.735	8	5.29	*	*	*	*	*	**
4	12.75	0.765	0.765	8	5.29	*	*	*	*	*	**
4	13.25	0.795	0.795	8	5.29	*	*	*	*	*	**
4	13.75	0.825	0.825	8	5.29	*	*	*	*	*	**
4	14.25	0.855	0.847	8	5.29	1.105	14.0	0.153	0.967	0.349	0.54
4	14.75	0.885	0.862	8	5.29	1.105	14.0	0.153	0.966	0.355	0.53
4	15.25	0.915	0.876	8	5.29	1.105	14.0	0.153	0.964	0.360	0.52
4	15.75	0.945	0.890	8	5.29	1.105	14.0	0.153	0.963	0.365	0.52
4	16.25	0.975	0.905	8	5.29	1.105	14.0	0.153	0.962	0.371	0.51
4	16.75	1.005	0.919	8	5.29	1.105	14.0	0.153	0.961	0.376	0.50
5	17.25	1.035	0.934	4	-	-	-	-	-	-	--
5	17.75	1.065	0.948	4	-	-	-	-	-	-	--
5	18.25	1.095	0.962	4	-	-	-	-	-	-	--
5	18.75	1.125	0.977	4	-	-	-	-	-	-	--
5	19.25	1.155	0.991	4	-	-	-	-	-	-	--
5	19.75	1.185	1.006	4	-	-	-	-	-	-	--
5	20.25	1.215	1.020	4	-	-	-	-	-	-	--
5	20.75	1.245	1.034	4	-	-	-	-	-	-	--
5	21.25	1.275	1.049	4	-	-	-	-	-	-	--

File Name: DRR.OUT

SOIL NO.	CALC. DEPTH (ft)	TOTAL STRESS (tsf)	EFF. STRESS (tsf)	FIELD N (B/ft)	FC DELTA N1_60	C N	CORR. (N1)60 (B/ft)	LIQUE. RESIST RATIO	r d	INDUC. STRESS RATIO	LIQUE. SAFETY FACTOR
6	21.75	1.305	1.063	4	3.96	1.001	8.3	0.092	0.949	0.417	0.27
6	22.25	1.335	1.078	4	3.96	1.001	8.3	0.092	0.948	0.420	0.27
6	22.75	1.365	1.092	4	3.96	1.001	8.3	0.092	0.947	0.423	0.27
7	23.25	1.395	1.106	4	3.96	0.962	8.3	0.091	0.946	0.426	0.26
7	23.75	1.425	1.121	4	3.96	0.962	8.3	0.091	0.945	0.429	0.26
7	24.25	1.455	1.135	4	3.96	0.962	8.3	0.091	0.943	0.432	0.26
8	24.75	1.485	1.150	4	-	-	-	-	-	-	-
8	25.25	1.515	1.164	4	-	-	-	-	-	-	-
8	25.75	1.545	1.178	4	-	-	-	-	-	-	-
8	26.25	1.575	1.193	4	-	-	-	-	-	-	-
8	26.75	1.605	1.207	4	-	-	-	-	-	-	-
8	27.25	1.635	1.222	4	-	-	-	-	-	-	-
8	27.75	1.665	1.236	4	-	-	-	-	-	-	-
8	28.25	1.695	1.250	4	-	-	-	-	-	-	-
8	28.75	1.725	1.265	4	-	-	-	-	-	-	-
9	29.25	1.755	1.279	14	-	-	-	-	-	-	-
9	29.75	1.785	1.294	14	-	-	-	-	-	-	-
9	30.25	1.815	1.308	14	-	-	-	-	-	-	-
9	30.75	1.845	1.322	14	-	-	-	-	-	-	-
9	31.25	1.875	1.337	14	-	-	-	-	-	-	-
9	31.75	1.905	1.351	14	-	-	-	-	-	-	-
9	32.25	1.935	1.366	14	-	-	-	-	-	-	-
9	32.75	1.965	1.380	14	-	-	-	-	-	-	-
10	33.25	1.995	1.394	12	-	-	-	-	-	-	-
10	33.75	2.025	1.409	12	-	-	-	-	-	-	-
10	34.25	2.055	1.423	12	-	-	-	-	-	-	-
10	34.75	2.085	1.438	12	-	-	-	-	-	-	-
10	35.25	2.115	1.452	12	-	-	-	-	-	-	-
10	35.75	2.145	1.466	12	-	-	-	-	-	-	-
10	36.25	2.175	1.481	12	-	-	-	-	-	-	-
10	36.75	2.205	1.495	12	-	-	-	-	-	-	-
11	37.25	2.235	1.510	17	5.13	0.803	20.8	0.211	0.871	0.461	0.57
11	37.75	2.265	1.524	17	5.13	0.803	20.8	0.211	0.867	0.461	0.57
11	38.25	2.295	1.538	17	5.13	0.803	20.8	0.211	0.863	0.460	0.57
11	38.75	2.325	1.553	17	5.13	0.803	20.8	0.211	0.859	0.460	0.57
11	39.25	2.355	1.567	17	5.13	0.803	20.8	0.211	0.855	0.459	0.57
11	39.75	2.385	1.582	17	5.13	0.803	20.8	0.211	0.851	0.459	0.57
11	40.25	2.415	1.596	17	5.13	0.803	20.8	0.211	0.846	0.458	0.57
11	40.75	2.445	1.610	17	5.13	0.803	20.8	0.211	0.842	0.457	0.57
11	41.25	2.475	1.625	17	5.13	0.803	20.8	0.211	0.838	0.457	0.57
11	41.75	2.505	1.639	17	5.13	0.803	20.8	0.211	0.834	0.456	0.57
11	42.25	2.535	1.654	17	5.13	0.803	20.8	0.211	0.830	0.455	0.57
11	42.75	2.565	1.668	17	5.13	0.803	20.8	0.211	0.826	0.454	0.58
12	43.25	2.595	1.682	30	3.79	0.779	30.7	Infin	0.822	0.453	NonLiq



CHRISTIAN WHEELER

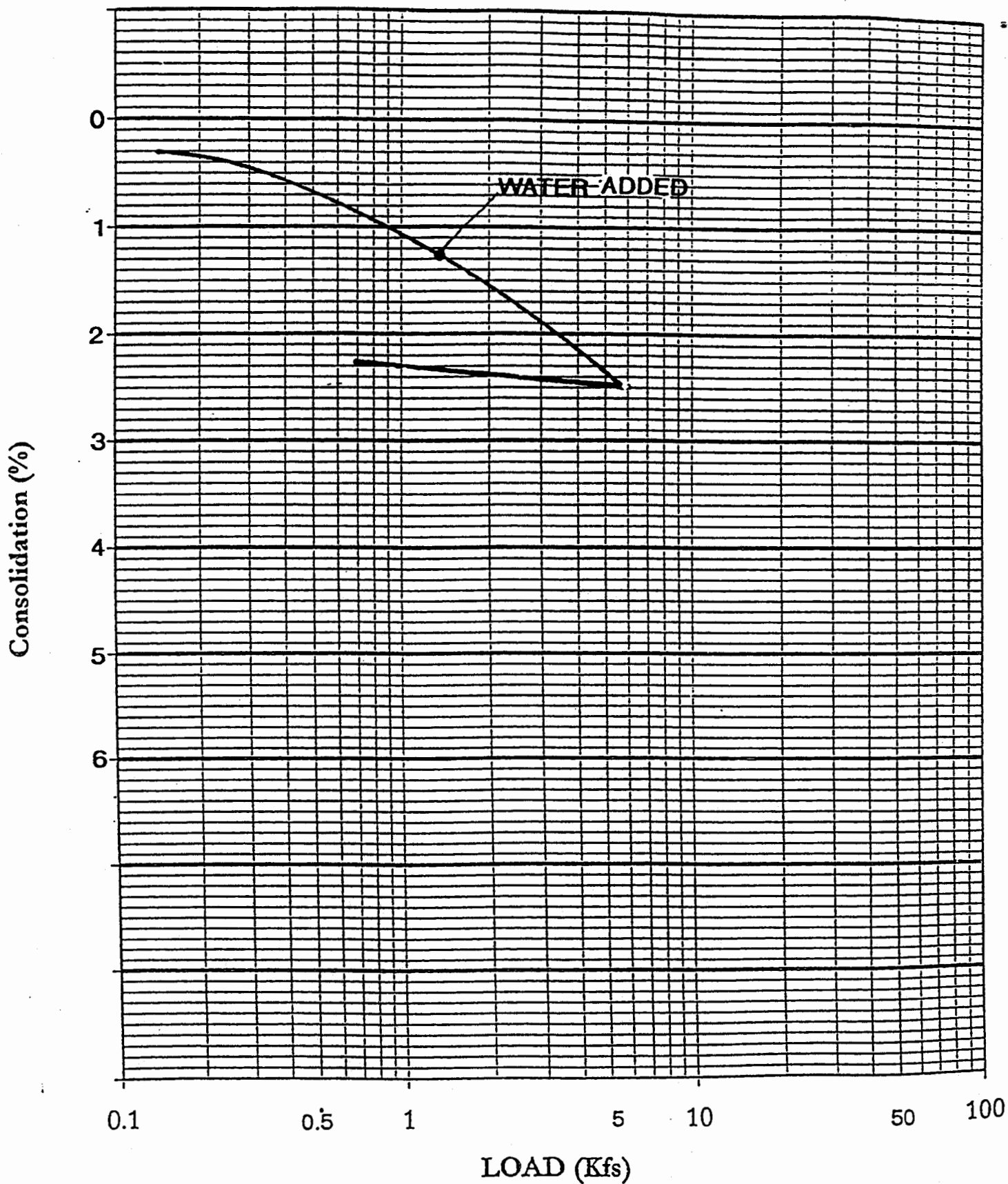
B-1 @ 40'

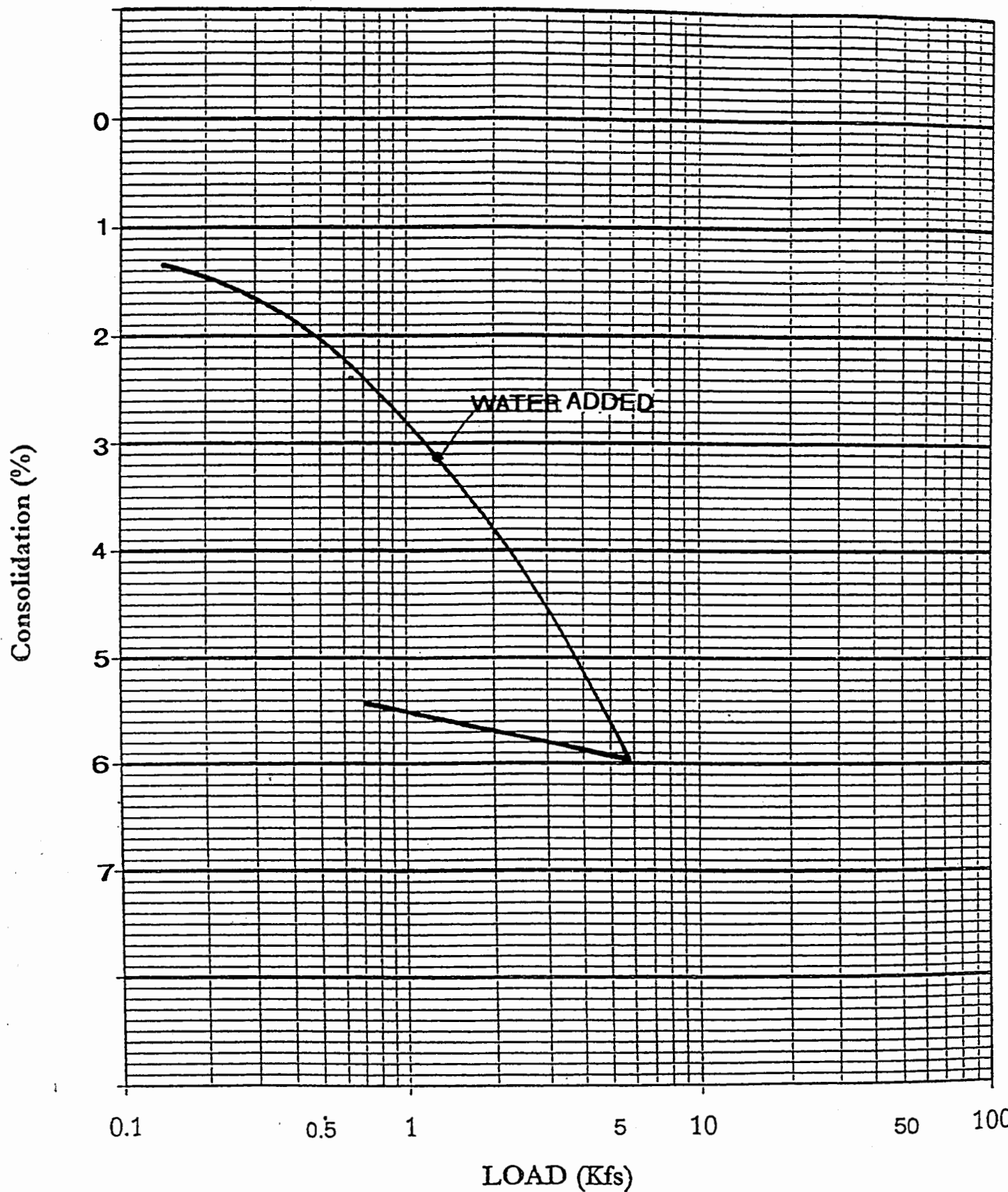
JOB NUMBER:

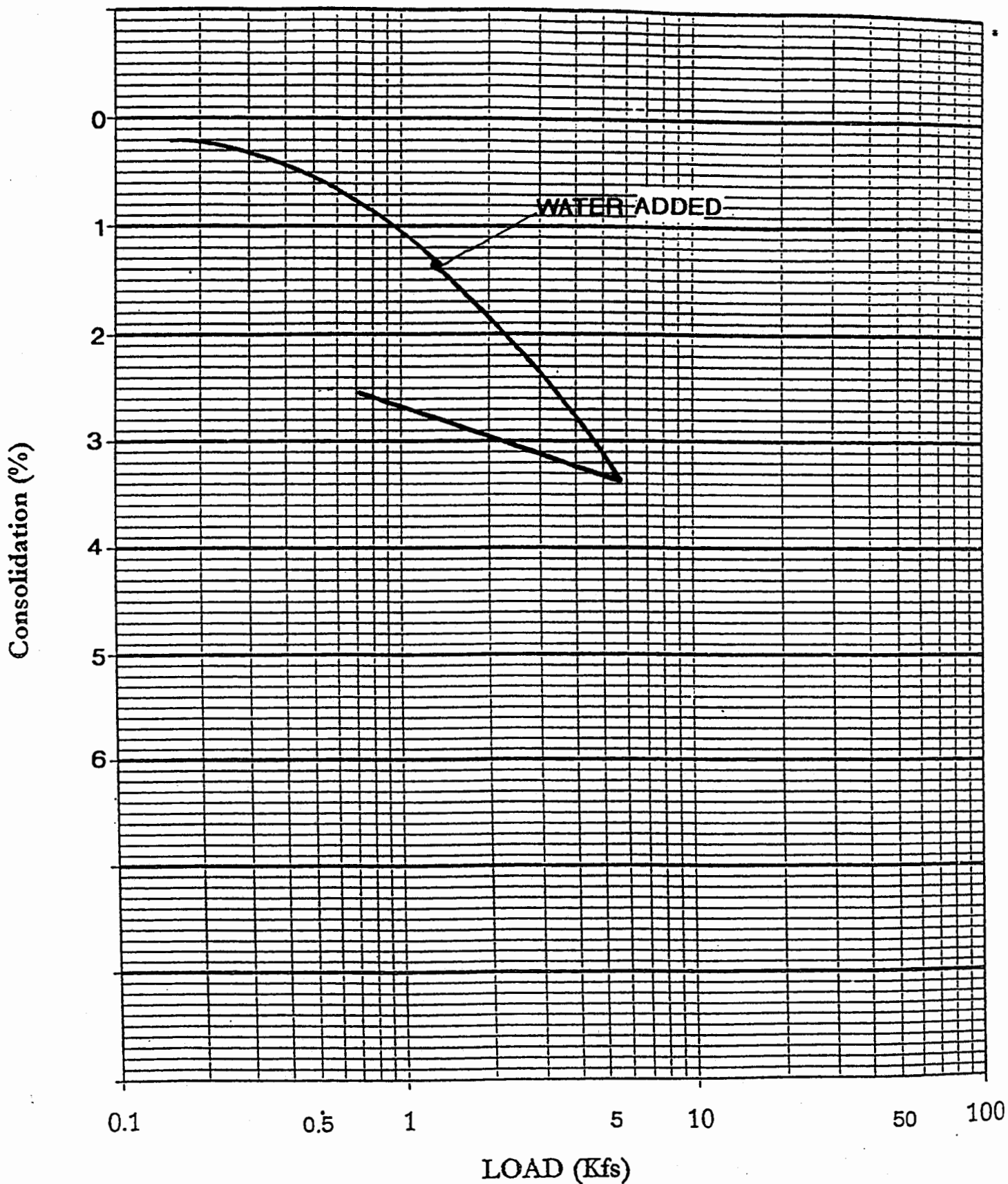
DATE:

OCTOBER 2000

PLATE NUMBER:







CHRISTIAN WHEELER

BY:

B-4 @ 15'

JOB NUMBER:

DATE:

OCTOBER 2000

PLATE NUMBER:

## REFERENCES

Anderson, J.G.; Rockwell, R.K. and Agnew, D.C., 1989, Past and Possible Future Earthquakes of Significance to the San Diego Region, Earthquake Spectra, Volume 5, No. 2, 1989.

California Division of Mines and Geology, 1998, Maps of Known Active Fault Near Source-Zones in California and Adjacent Portions of Nevada.

City of San Diego, 1995, SEISMIC HAZARD STUDY, Geologic Hazards and Faults, Sheet 20, Scale 1" = 800'.

Federal Emergency Management Agency, 1997, San Diego County, California and Incorporated Areas Flood Insurance Rate Map, Panel 1914 of 2375, Map Number 06073C1613 F.

Hart, E.W., 1994, Fault-Rupture Hazard Zones in California, California Division of Mines and Geology Special Publication 42.

Jennings, C.W., 1975, Fault Map of California, California Division of Mines and Geology, Map No. 1, Scale 1:750,000.

Kennedy, Michael P., 1975, Geology of the San Diego Metropolitan Area, California, California Division of Mines and Geology, Bulletin 200.

Kern, P., 1989, Earthquakes and Faults in San Diego County, Pickle Press, 73 pp.

Mualchin, L. and Jones, A.L., 1992, Peak Acceleration from Maximum Credible Earthquakes in California (Rock and Stiff-Soil Sites) California Division of Mines and Geology Open-File Report 92-1.

Tan, S.S., 1995, Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California, California Division of Mines and Geology Open-File Report 95-03.

Wesnousky, S.G., 1986, "Earthquakes, Quaternary Faults, and Seismic Hazards in California", in Journal of Geophysical Research, Volume 91, No. B12, pp 12,587 to 12,631, November 1986.

## TOPOGRAPHIC MAPS

City of San Diego, 1953, 200-Scale Topographic Map, Sheet 218-1695.

City of San Diego, 1963, 200-Scale Topographic Map, Sheet 218-1695.

City of San Diego, 1978, 200-Scale Orthographic Map, Sheet 218-1695.

### PHOTOGRAPHS

Aerial FotoBank Inc., 1996, Aerial Foto-Map Book, San Diego County, 1995-96, Sheet 1268.

Aerial Map Industries, 1968, Aerial Atlas, San Diego County, Sheet SD29.

Lenska Aerial Images, 1994, Aerial Atlas, San Diego County, Sheet 1268

San Diego County, 1928, Flight 59C, Photographs 6 and 7; Scale: 1 inch = 2000 feet (approximate).

San Diego County, 1970, Flight 5, Photographs 3 and 4; Scale: 1 inch = 1000 feet (approximate).

San Diego County, 1973, Flight 30, Photographs 10 and 11; Scale: 1 inch = 1000 feet (approximate).

San Diego County, 1978, Flight 19C, Photographs 28 and 29; Scale: 1 inch = 1000 feet (approximate).

San Diego County, 1983, Photographs 623 and 624; Scale: 1 inch = 1000 feet (approximate).

San Diego County, 1978, Flight 1, Photograph 159; Scale: 1 inch = 2000 feet (approximate).

United States Department of Agriculture, 1953, Photographs 4M-93 and 94; Scale: 1 inch = 1700 feet (approximate).



## RECOMMENDED GRADING SPECIFICATIONS - GENERAL PROVISIONS

### SEA WORLD ATLANTAS RIDE PROJECT SEA WORLD ENTERTAINMENT PARK SAN DIEGO, CALIFORNIA

#### GENERAL INTENT

The intent of these specifications is to establish procedures for clearing, compacting natural ground, preparing areas to be filled, and placing and compacting fill soils to the lines and grades shown on the accepted plans. The recommendations contained in the preliminary geotechnical investigation report and/or the attached Special Provisions are a part of the Recommended Grading Specifications and shall supersede the provisions contained hereinafter in the case of conflict. These specifications shall only be used in conjunction with the geotechnical report for which they are a part. No deviation from these specifications will be allowed, except where specified in the geotechnical report or in other written communication signed by the Geotechnical Engineer.

#### OBSERVATION AND TESTING

Christian Wheeler Engineering shall be retained as the Geotechnical Engineer to observe and test the earthwork in accordance with these specifications. It will be necessary that the Geotechnical Engineer or his representative provide adequate observation so that he may provide his opinion as to whether or not the work was accomplished as specified. It shall be the responsibility of the contractor to assist the Geotechnical Engineer and to keep him apprised of work schedules, changes and new information and data so that he may provide these opinions. In the event that any unusual conditions not covered by the special provisions or preliminary geotechnical report are encountered during the grading operations, the Geotechnical Engineer shall be contacted for further recommendations.

If, in the opinion of the Geotechnical Engineer, substandard conditions are encountered, such as questionable or unsuitable soil, unacceptable moisture content, inadequate compaction, adverse weather, etc., construction should be stopped until the conditions are remedied or corrected or he shall recommend rejection of this work.

Tests used to determine the degree of compaction should be performed in accordance with the following American Society for Testing and Materials test methods:

Maximum Density & Optimum Moisture Content - ASTM D-1557-91

Density of Soil In-Place - ASTM D-1556-90 or ASTM D-2922

All densities shall be expressed in terms of Relative Compaction as determined by the foregoing ASTM testing procedures.

#### PREPARATION OF AREAS TO RECEIVE FILL

All vegetation, brush and debris derived from clearing operations shall be removed, and legally disposed of. All areas disturbed by site grading should be left in a neat and finished appearance, free from unsightly debris.

After clearing or benching the natural ground, the areas to be filled shall be scarified to a depth of 6 inches, brought to the proper moisture content, compacted and tested for the specified minimum degree of compaction. All loose soils in excess of 6 inches thick should be removed to firm natural ground which is defined as natural soil which possesses an in-situ density of at least 90 percent of its maximum dry density.

When the slope of the natural ground receiving fill exceeds 20 percent (5 horizontal units to 1 vertical unit), the original ground shall be stepped or benched. Benches shall be cut to a firm competent formational soil. The lower bench shall be at least 10 feet wide or 1-1/2 times the equipment width, whichever is greater, and shall be sloped back into the hillside at a gradient of not less than two (2) percent. All other benches should be at least 6 feet wide. The horizontal portion of each bench shall be compacted prior to receiving fill as specified herein for compacted natural ground. Ground slopes flatter than 20 percent shall be benched when considered necessary by the Geotechnical Engineer.

Any abandoned buried structures encountered during grading operations must be totally removed. All underground utilities to be abandoned beneath any proposed structure should be removed from within 10 feet of the structure and properly capped off. The resulting depressions from the above described procedure should be backfilled with acceptable soil that is compacted to the requirements of the Geotechnical Engineer. This includes, but is not limited to, septic tanks, fuel tanks, sewer lines or leach lines, storm drains and water lines. Any buried structures or utilities not to be abandoned should be brought to the attention of the Geotechnical Engineer so that he may determine if any special recommendation will be necessary.

All water wells which will be abandoned should be backfilled and capped in accordance to the requirements set forth by the Geotechnical Engineer. The top of the cap should be at least 4 feet below finish grade or 3

feet below the bottom of footing whichever is greater. The type of cap will depend on the diameter of the well and should be determined by the Geotechnical Engineer and/or a qualified Structural Engineer.

#### **FILL MATERIAL**

Materials to be placed in the fill shall be approved by the Geotechnical Engineer and shall be free of vegetable matter and other deleterious substances. Granular soil shall contain sufficient fine material to fill the voids. The definition and disposition of oversized rocks and expansive or detrimental soils are covered in the geotechnical report or Special Provisions. Expansive soils, soils of poor gradation, or soils with low strength characteristics may be thoroughly mixed with other soils to provide satisfactory fill material, but only with the explicit consent of the Geotechnical Engineer. Any import material shall be approved by the Geotechnical Engineer before being brought to the site.

#### **PLACING AND COMPACTION OF FILL**

Approved fill material shall be placed in areas prepared to receive fill in layers not to exceed 6 inches in compacted thickness. Each layer shall have a uniform moisture content in the range that will allow the compaction effort to be efficiently applied to achieve the specified degree of compaction. Each layer shall be uniformly compacted to the specified minimum degree of compaction with equipment of adequate size to economically compact the layer. Compaction equipment should either be specifically designed for soil compaction or of proven reliability. The minimum degree of compaction to be achieved is specified in either the Special Provisions or the recommendations contained in the preliminary geotechnical investigation report.

When the structural fill material includes rocks, no rocks will be allowed to nest and all voids must be carefully filled with soil such that the minimum degree of compaction recommended in the Special Provisions is achieved. The maximum size and spacing of rock permitted in structural fills and in non-structural fills is discussed in the geotechnical report, when applicable.

Field observation and compaction tests to estimate the degree of compaction of the fill will be taken by the Geotechnical Engineer or his representative. The location and frequency of the tests shall be at the Geotechnical Engineer's discretion. When the compaction test indicates that a particular layer is at less than the required degree of compaction, the layer shall be reworked to the satisfaction of the Geotechnical Engineer and until the desired relative compaction has been obtained.

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compaction by sheepsfoot roller shall be at vertical intervals of not greater than four feet. In addition, fill slopes at a ratio of two horizontal to one vertical or flatter, should be trackrolled. Steeper fill slopes shall be over-built and cut-back to finish contours after the slope has been constructed. Slope compaction operations shall result in all fill material six or more inches inward from the finished face of the slope having a relative compaction of at least 90 percent of maximum dry density or the degree of compaction specified in the Special Provisions section of this specification. The compaction operation on the slopes shall be continued until the Geotechnical Engineer is of the opinion that the slopes will be surficially stable.

Density tests in the slopes will be made by the Geotechnical Engineer during construction of the slopes to determine if the required compaction is being achieved. Where failing tests occur or other field problems arise, the Contractor will be notified that day of such conditions by written communication from the Geotechnical Engineer or his representative in the form of a daily field report.

If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no cost to the Owner or Geotechnical Engineer.

## CUT SLOPES

The Engineering Geologist shall inspect cut slopes excavated in rock or lithified formational material during the grading operations at intervals determined at his discretion. If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer to determine if mitigating measures are necessary.

Unless otherwise specified in the geotechnical report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of the controlling governmental agency.

## ENGINEERING OBSERVATION

Field observation by the Geotechnical Engineer or his representative shall be made during the filling and compaction operations so that he can express his opinion regarding the conformance of the grading with acceptable standards of practice. Neither the presence of the Geotechnical Engineer or his representative or

the observation and testing shall release the Grading Contractor from his duty to compact all fill material to the specified degree of compaction.

### SEASON LIMITS

Fill shall not be placed during unfavorable weather conditions. When work is interrupted by heavy rain, filling operations shall not be resumed until the proper moisture content and density of the fill materials can be achieved. Damaged site conditions resulting from weather or acts of God shall be repaired before acceptance of work.

### RECOMMENDED GRADING SPECIFICATIONS - SPECIAL PROVISIONS

**RELATIVE COMPACTION:** The minimum degree of compaction to be obtained in compacted natural ground, compacted fill, and compacted backfill shall be at least 90 percent. For street and parking lot subgrade, the upper six inches should be compacted to at least 95 percent relative compaction.

**EXPANSIVE SOILS:** Detrimentially expansive soil is defined as clayey soil which has an expansion index of 50 or greater when tested in accordance with the Uniform Building Code Standard 29-2.

**OVERSIZED MATERIAL:** Oversized fill material is generally defined herein as rocks or lumps of soil over 6 inches in diameter. Oversized materials should not be placed in fill unless recommendations of placement of such material is provided by the Geotechnical Engineer. At least 40 percent of the fill soils shall pass through a No. 4 U.S. Standard Sieve.

**TRANSITION LOTS:** Where transitions between cut and fill occur within the proposed building pad, the cut portion should be undercut a minimum of one foot below the base of the proposed footings and recompacted as structural backfill. In certain cases that would be addressed in the geotechnical report, special footing reinforcement or a combination of special footing reinforcement and undercutting may be required.

**EXHIBIT H**



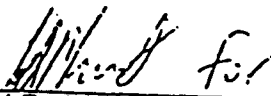
**FLUOR DANIEL GTI**

**ASSESSMENT REPORT  
SEA WORLD LEASE EXPANSION  
1720 SOUTH SHORES ROAD  
SAN DIEGO, CALIFORNIA  
HMMD CASE NO. H21142  
June 9, 1997**

Fluor Daniel GTI Project 023400221

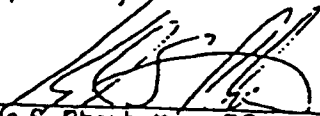
Prepared for:  
Mr. Kevin Carr  
Sea World Of California  
1720 South Shores Road  
San Diego, California 92109-7995

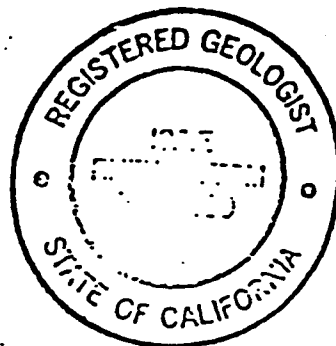
Fluor Daniel GTI, Inc.  
Submitted by:

  
Fred Essig  
Staff Geologist

  
Anthony D. Konzen  
Senior Project Manager

Fluor Daniel GTI, Inc.  
Approved by:

  
Kyle S. Rheubottom, RG  
Operations Manager



023400221  
0221R-02.20/Sea World/LE/01

## CONTENTS

1.0	INTRODUCTION .....	1
1.1	Site Identification .....	1
1.2	Purpose of Work .....	1
1.3	Background .....	2
1.4	Scope of Services .....	2
2.0	GEOLOGY AND HYDROGEOLOGY .....	3
2.1	Geology .....	3
2.2	Site Geologic Description/Soil Types .....	3
2.3	Hydrogeology .....	4
2.4	Summary of the Phase I Report .....	4
3.0	HEALTH AND SAFETY .....	5
4.0	PERMITTING .....	5
5.0	PRELIMINARY DRILLING ASSESSMENT .....	6
5.1	Drilling .....	6
5.2	Soil and Groundwater Disposal .....	6
5.3	Soil Sampling and Analyses .....	6
5.4	Groundwater Sampling and Analysis .....	7
6.0	FINDINGS .....	7
6.1	Soil Analytical Results .....	7
6.2	Groundwater Analytical Results .....	8
7.0	SUMMARY .....	9
8.0	REFERENCES .....	10





## Figures

1. Site Location Map
2. Site Plan
3. Groundwater Gradient Map
4. Hydrocarbon Concentrations in Soil
5. Acetone Concentrations in Soil
6. Cross Sections A-A' and B-B'
7. 1,1,1-Trichloroethane Concentrations in Groundwater

## Tables

1. Monitoring Data, Sampled January 20, 1997, Sea World, 1720 South Shores Drive, San Diego, California
2. Soil Analytical Results, Sampled December 20 and 23, 1996 and January 9, 1997, Sea World, 1720 South Shores Drive, San Diego, California
3. Groundwater Analytical Results, Sampled January 20, 1997 and April 29, 1997, Sea World, 1720 South Shores Drive, San Diego, California

## Appendices

1. Boring Logs
2. Boring Permit
3. Non-hazardous Waste Data Forms
4. Soil Sampling QA/QC Procedures, Laboratory Analytical Reports, and Chain-of-Custodies



## 1.0 INTRODUCTION

### 1.1 Site Identification

Company Name: Sea World of California

Site Address: 1720 South Shores Road  
San Diego, California 92109

Assessors Parcel No.: 435-480-15

HMMD Case No.: H00905

Property Owner: City of San Diego Real Estate Assets  
1200 Third Avenue  
San Diego, California 92101  
(619) 236-6985  
Attn: Linda Fierro

Contact Person: Mr. Kevin Carr  
1720 South Shores Road  
San Diego, California 92109  
(619) 226-3934

Responsible Party: Sea World of California  
1720 South Shores Road  
San Diego, California 92109

### 1.2 Purpose of Work

The purpose of this investigation was to summarize past and present site use, and analyze soil and groundwater in the subsurface for the presence of gasoline hydrocarbons, volatile organic and semi-volatile organic compounds, and CAM metals.

The investigation centered on a parcel of City-owned land immediately east of the Sea World Park Boundary. The parcel is within the inactive Mission Bay Landfill and is currently under a landfill monitoring program overseen by the Regional Water Quality Control Board (RWQCB) (Figures 1 and 2). Wells MBW-2 and 3 shown on Figure 2 were installed by the City of San Diego, and are included in the RWQCB monitoring program.



### 1.3 Background

Site activities performed to date are summarized below.

- The City of San Diego used the area as an unrestricted Class 1 landfill from 1952 to 1959.
- Between 1959 and 1962, 5 to 20 feet of hydraulic fill was placed over the landfill.
- Woodward-Clyde Consultants (WWC) submitted a summary of a comprehensive investigation into the extent and hazardous waste content of the City of San Diego's Mission Bay Landfill. (WWC, 1983).
- California RWQCB Order No. 85-78 (September 16, 1985) established periodic sampling of groundwater within the landfill plus surface water and sediment sampling of Mission Bay and the San Diego River.
- In 1996 Sea World planned to lease the parcel immediately to the east of the park.
- In December 1996 and January 1997, Fluor Daniel GTI, Inc. (Fluor Daniel GTI) conducted Phase I and Phase II investigations on the undeveloped parcel located east of the Sea World property boundary. On April 29, 1997, an additional round of groundwater samples was collected from wells LE-1 through LE-6 for metals analyses.

### 1.4 Scope of Services

Fluor Daniel GTI performed or subcontracted the following work in accordance with the Cost Estimate For Phase I and II Site for Sea World Expansion - East (Fluor Daniel GTI, 1996).

#### Phase I Investigation

- Compiled a Phase I assessment report in general accordance with the instructions from Sea World dated April 22, 1996. The assessment data was compiled from the following sources: regulatory file reviews, personal interviews, site reconnaissance, data base reviews, and review of photographic archives.



### Phase II Investigation

- Obtained permits to drill and install six groundwater monitoring wells.
- Obtained an Underground Service Alert number and met with utility companies prior to drilling.
- Drilled, logged, sampled, and installed six wells ranging in depth from 33 to 35 feet below grade (Figure 2).
- Collected soil samples at approximate 5-foot intervals for lithologic evaluation and laboratory analysis.
- Purged and sampled the 6 monitoring wells (2 events).
- Coordinated analysis of 12 soil samples and 6 groundwater samples.
- Prepared a "30-day" drilling report as required by the San Diego County Site Assessment and Mitigation Division (SAMD).
- Prepared an assessment report summarizing Phase I research and this most recent landfill-site assessment.

## 2.0 GEOLOGY AND HYDROGEOLOGY

### 2.1 Geology

As mapped by Kennedy and Peterson (1975), the site is built upon land reclaimed by hydraulic fill which is apparently underlain by formations included in the Eocene Poway and La Jolla Groups. The site is situated on the south side of Mission Bay essentially at sea level (Figure 1). The study area has little relief except that dictated by structures in the vicinity.

### 2.2 Site Geologic Description/Soil Types

As observed from the borings drilled by Fluor Daniel GTI on December 20 and 23, 1996 and on January 9, 1997, the site is underlain by hydraulic fill that extends to the maximum depths explored. The hydraulic fill is characterized by randomly distributed sand and sand/silt mixtures with trace amounts of gravel. Boring logs from the recent drilling investigation are presented in Appendix 1.

The November 17, 1983 WWC report described encountering various types of landfill waste (i.e., wood, paper, glass, etc.) during 1980 test pit excavation. Landfill debris was not encountered during December 1996 through January 1997 drilling investigation, indicating that the borings were not within the landfill limits.

## 2.3 Hydrogeology

The site lies within the Mission San Diego Hydrologic Subarea (HSA 7.11) of the Lower San Diego Hydrologic Area (HA 7.10) of the San Diego Hydrologic Unit (HU 7.00). Because the site is west of Interstate 5, there are no beneficial uses for groundwater (RWQCB, San Diego Region Basin Planning Area).

Surface drainage in the vicinity of the site is toward Mission Bay immediately to the north. The San Diego River floodway is located approximately one-half mile to the south. There are no permanent streams in the area surrounding the site (Figure 1).

Groundwater depths gauged on January 20, 1997 ranged from 11.68 to 21.32 feet below grade. Because of significant tidal influence, groundwater gradient and flow were not determined. Groundwater elevations are presented in Figure 3 and Table 1.

The tidal influence on groundwater elevation was measured in well LE-3 on January 9, 1997. The groundwater elevation in LE-3 declined 4.2 feet between 8:50 AM and 3:30 PM. Because of this tidal influence and the likelihood of lateral permeability variations due to the random nature of artificial fill emplacement, a groundwater gradient map was not prepared.

## 2.4 Summary of the Phase I Report

The WWC *Site Assessment Report* summarizes the findings of a comprehensive investigation into the extent and hazardous waste content of the City of San Diego's Mission Bay Landfill. According to the report, the landfill occupies approximately 115 acres in the southeast corner of Mission Bay. The lease expansion is located above the western extent of the landfill. The City of San Diego used the area as an unrestricted Class I landfill from 1952 to 1959. The landfill received up to 25,000 cubic yards of municipal and commercial waste per month. Of most concern, the landfill reportedly received unknown amounts of hazardous industrial wastes including: carbon tetrachloride, methyl-ethyl ketone, toluene, chlorinated cleaning solvents, paint and oil waste, sulfuric acid, hydrofluoric

☆ acid, chromic acid, hydrochloric acid, cyanide, zinc chromate, and cadmium. Between 1959 and 1962, 5 to 20 feet of hydraulic fill was placed over the landfill. The scope of the site assessment investigation performed by WWC included reviewing landfill operation documents, photographs and reports, interviewing landfill eyewitnesses, conducting geophysical and soil gas surveys, and drilling and sampling soil borings and groundwater monitoring wells. The report had a number of conclusions: 1) As many as 130 metallic drums per acre were dumped in the landfill. Most of these drums would have corroded and released their contents within ten years. 2) Elevated concentrations of arsenic, cadmium, copper, lead, mercury, and zinc were observed in landfill waste samples. The metals likely exist as metallic sulfides which have limited mobility. 3) Hydrocarbon pollutant concentrations were generally low. Detectable acetone concentrations were on the order of 1 parts per million (ppm). Naphthalene and phenanthrene were detected at concentrations up to 13 ppm and 6.2 ppm, respectively. 4) Carbon tetrachloride, cyanide, and polychlorinated biphenyls (PCBs) were not detected in soil samples. 5) Groundwater samples contained elevated concentrations of arsenic, copper, nickel, lead, and zinc. Acetone was detected in groundwater at concentrations up to 41,000 parts per billion (ppb). Eleven other volatile organic compounds were found at concentrations up to 50 ppb. Twenty extractable organic compounds were found at concentrations up to 5 ppb.

### 3.0 HEALTH AND SAFETY

A site-specific health and safety plan was prepared prior to drilling. An "Agreement and Acknowledgment" statement was signed by on-site personnel indicating that the health and safety plan had been read and understood. Hydrogen sulfide and methane gas were identified site-specific hazards and air monitoring was performed continuously throughout the well drilling and installation procedure.

### 4.0 PERMITTING

A boring permit for six monitoring wells was acquired from the San Diego County HMMD prior to drilling (Appendix 2).

## 5.0 PRELIMINARY DRILLING ASSESSMENT

### 5.1 Drilling

On December 20 and 23, 1996, wells LE-1, LE-2, and LE-3 were drilled and installed in the lease expansion area (Figure 2). During the drilling of LE-4, on December 23, hydrogen sulfide gas was detected at concentrations as high as 9 ppm and methane was detected at a maximum of 1,000 ppm. Drilling was immediately halted and boring LE-4 was backfilled. On January 9, 1997 the drilling was again mobilized following additional study and preparation for the hydrogen sulfide and methane hazard. Wells LE-5 and LE-6 were installed and boring LE-4 was re-drilled and converted to a monitoring well. To minimize exposure to methane and hydrogen sulfide gasses, work was conducted up-wind and fans were used to ventilate the work area.

The wells were drilled with a CME-75 drill rig using 8 and 9-inch diameter hollow-stem augers.

### 5.2 Soil and Groundwater Disposal

On May 1, 1997, seventeen drums of soil cuttings were disposed of at the waste disposal facility in McKittrick, California. Twelve drums of auger rinsate and well purge water were disposed of at DeMenno/Kerdoon in Compton, California on May 5, 1997. The soil and water were transported under non-hazardous waste manifests (Appendix 3).

Of the drums disposed of, nine soil and one water were generated during a previous investigation at the Sea World Wild Arctic Exhibit.

### 5.3 Soil Sampling and Analyses

Samples were collected at approximate 5-foot intervals for lithologic description and hydrocarbon analyses. Samples were collected in general accordance with the Quality Assurance/Quality Control procedures listed in Appendix 4.

Two soil samples were selected from each of the six borings for analysis. All soil samples were analyzed for hydrocarbon components using the EPA Method 8015 hydrocarbon screen. Additionally, all soil samples from borings LE-1 through LE-4 were analyzed for volatile organic

compounds by EPA method 8020 and one soil sample from each of the six borings was analyzed for volatile and semi-volatile organic compounds using EPA methods 8240, and 8270, respectively. Analyses of soil samples were performed by Del Mar Analytical, a State-certified laboratory. After further discussions with Sea World in April 1997, one sample from each boring was additionally analyzed for CAM metals.

#### 5.4 Groundwater Sampling and Analysis

Wild Arctic well WA-3 was gauged and Lease Expansion wells LE-1 through LE-6 were gauged, purged, and sampled on January 20, 1997. Wells LE-1 through LE-6 were gauged, purged and sampled again on April 29, 1997.

One sample was submitted from each well for analysis. The samples collected on January 20 were analyzed for organic lead, total lead, volatile organics, and semi-volatile organics using the California DHS Method, and EPA Methods 7421, 8240, and 8270, respectively. The samples collected on April 29 were analyzed for CAM metals.

Chemical analyses of the groundwater samples were performed by Del Mar Analytical. Samples were collected in general accordance with the Quality Assurance/Quality Control procedures listed in Appendix 4. To reduce interference from soil particles in suspension, groundwater samples collected on April 29 were filtered and acidified at the laboratory prior to metals analyses.

### 6.0 FINDINGS

#### 6.1 Soil Analytical Results

Twelve soil samples were analyzed for hydrocarbon components using the EPA Method 8015 hydrocarbon screen. Samples from wells LE-1 through LE-5 were screened in the  $C_6$  to  $C_{14}$  range (gas standard and diesel standard) and analyzed for volatile organic (BTEX) compounds using EPA method 8020. Samples from wells LE-5 and LE-6 were screened against the  $C_{10}$  to  $C_{40}$  diesel fuel standard (Figure 4). Soil analytical data are summarized in Table 2. Laboratory reports are in Appendix 4.





Hydrocarbons within the  $C_{22}$  through  $C_{44}$  range were detected in soil from well LE-1 at 10 feet below grade (79 milligrams per kilogram, mg/kg). Hydrocarbons within the  $C_{10}$  through  $C_{44}$  range were detected in both samples from well LE-4 (200 mg/kg at 10 feet, 380 mg/kg at 15 feet below grade). The hydrocarbons sources for the  $C_{10}$  to  $C_{20}$  range are likely diesel-weight fuels and solvents; source materials for the  $C_{20}$  to  $C_{44}$  range include heavier oils such as hydraulic, motor, and natural oils.

One sample from each of the six borings was analyzed for volatile organics, semi-volatile organics, and metals using EPA methods 8240, 8270, and various EPA 6000 and 7000 methods. Acetone was detected 15 feet below grade in wells LE-3, LE-4, LE-5, and LE-6 at 26 micrograms per kilogram ( $\mu\text{g/kg}$ ), 220  $\mu\text{g/kg}$ , 21  $\mu\text{g/kg}$ , and 14  $\mu\text{g/kg}$ , respectively (Figures 5 and 6). In well LE-4, 2-butanone (MEK) was detected 15 feet below grade at 36  $\mu\text{g/kg}$ . Acetone and 2-butanone are solvents typically used in the aerospace industries, their detection most likely the result of aerospace manufacturing-waste disposal in the former landfill. These same constituents were detected at higher concentrations during the 1983 WWC investigation. Acetone and 2-butanone are not listed as constituents of concern in the Basin Plan guidelines.

Generally, metals analyses showed detectable concentrations of arsenic, barium, total chromium, cadmium, cobalt, copper, lead, molybdenum, nickel, vanadium and zinc. Sample LE-2-10 had a chromium concentration of 79 mg/kg which exceeded the soluble threshold limit concentration (STLC) by more than 10 times. However, the remaining samples and the statistical mean were below the 10 times limit. None of the metals exceeded the total threshold limit concentration (TTL) values.

## 6.2 Groundwater Analytical Results

No total lead or organic lead were found in any of the groundwater samples. Groundwater analytical data is summarized in Table 3, laboratory reports are in Appendix 4.

On January 20, 1997, detectable 1,1,1-trichloroethane concentrations ranged from 2.4 micrograms per liter ( $\mu\text{g/L}$ ) in wells LE-4 and LE-6 to 7.2  $\mu\text{g/L}$  in LE-2. Only well LE-3 contained nondetectable 1,1,1-trichloroethane. The contaminant appears to be widely dispersed in a relatively uniform concentration, consistent with dated landfill disposal of barrels in a corrosive environment. 1,1,1-Trichloroethane is widely used as a solvent in the aerospace industry. Figure 7 shows the distribution of 1,1,1-trichloroethane in the "LE" series wells.



PRG PPB	
top	so.
H <sub>2</sub> O	
Acetone	610 1600
MEK	1900 7300

The groundwater Maximum Contaminant Limit (MCL) concentration in the Basin Plan for 1,1,1-trichloroethane is 200  $\mu\text{g/L}$ . During this investigation, 1,1,1-trichloroethane concentrations did not exceed MCL limits (Table 3).

Generally, metals analyses showed detectable concentrations of barium, selenium, silver, and zinc (Table 3). A majority of the metals concentrations were below detection limits. Dissolved selenium, silver, and zinc concentrations exceeded Basin Plan oceanwater quality goals (RWQCB, 1994). However, applicable groundwater MCLs for these metals are unlisted in the Basin Plan.

## 7.0 SUMMARY

- In December 1996 and January 1997, wells LE-1 through LE-6 were drilled and installed. Landfill debris was not encountered during drilling.
- The site lies within the Mission San Diego Hydrologic Subarea (HSA 7.11) of the Lower San Diego Hydrologic Area (HA 7.10) of the San Diego Hydrologic Unit (HU 7.00). Based on the January 20, 1997 gauging, groundwater depths at the site were between 11.68 and 21.32 feet below grade. Due to tidal fluctuations, groundwater gradient and flow direction were not determined.
- Hydrocarbons within the  $C_{22}$  through  $C_{44}$  range were detected in soil from well LE-1 at 10 feet below grade (79 mg/kg). Hydrocarbons within the  $C_{10}$  through  $C_{44}$  range were detected in both samples from well LE-4 (200 mg/kg at 10 feet, 380 mg/kg at 15 feet below grade). The hydrocarbons sources for the  $C_{10}$  to  $C_{30}$  range are likely diesel-weight fuels and solvents, source materials for the  $C_{30}$  to  $C_{44}$  range include heavier oils such as hydraulic, motor, and natural oils.
- Acetone in soil was detected 15 feet below grade in wells LE-3, LE-4, LE-5, and LE-6 at 26  $\mu\text{g/kg}$ , 220  $\mu\text{g/kg}$ , 21  $\mu\text{g/kg}$ , and 14  $\mu\text{g/kg}$ , respectively. In well LE-4, 2-butanone (MEK) was detected 15 feet below grade at 36  $\mu\text{g/kg}$ . Acetone and 2-butanone are solvents typically used in the aerospace industries, their detection most likely the result of aerospace manufacturing-waste disposal in the former landfill. Metals analyses generally showed detectable arsenic, barium, total chromium, cadmium, cobalt, copper, lead, molybdenum, nickel, vanadium and zinc. Concentrations were below levels discussed in the 1983 WWC report, and below TTLC levels. Some of the metals concentrations likely represent natural background concentrations.

- 1,1,1-trichloroethane was found in groundwater samples from every well except LE-3 at concentrations from 2.4  $\mu\text{g/L}$  in well LE-4 and LE-6 to 7.2  $\mu\text{g/L}$  in LE-2. The contaminant appears to be widely dispersed in a relatively uniform concentration, consistent with dated landfill disposal of barrels in a corrosive environment. 1,1,1-Trichloroethane is widely used as a solvent in the aerospace industry. The Basin Plan MCL concentration for 1,1,1-trichloroethane is 200  $\mu\text{g/L}$ . During this investigation 1,1,1-trichloroethane concentrations did not exceed MCL limits. No other organic compounds listed in the Basin Plan as contaminants of concern were detected in this investigation.
- Detectable concentrations of barium, silver, selenium and zinc were measured in groundwater samples. Applicable Basin Plan groundwater quality goals are not listed. Chromium, cobalt, copper and other metals detected in the WWC wells were not detected in the "LE" series wells.

## 8.0 REFERENCES

- California Water Resources Control Board and California Regional Water Quality Control Board, San Diego Region (9), June 1994, *Comprehensive Water Quality Control Plan for the San Diego Basin*.
- California Water Regional Water Quality Control Board, San Diego Region, 1990, Resolution No. 90-55, *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region*.
- Fluor Daniel GTI, Inc., 1996, *Cost Estimate For Phase I and II Site for Sea World Expansion - East*, May 7.
- Kennedy and Peterson, 1975, *Geology of the San Diego Metropolitan Area, California*, California Division of Mines and Geology, Bulletin 200.
- Woodward-Clyde Consultants, 1983, *Site Assessment Report*, November 17.



**TABLE 1**  
**Monitoring Data**  
**Sampled January 20, 1997**  
**Sea World, 1720 South Shores Drive, San Diego, California**

Well ID	DTW	TOC Surveyed Wellhead Elevation	Elevation of Water
WA-1	NA	22.22	
WA-2	NA	20.39	
WA-3	15.35	19.23	3.88
LE-1	21.32	24.36	3.04
LE-2	11.68	15.11	3.43
LE-3	14.85	19.99	5.14
LE-4	15.96	20.28	4.32
LE-5	15.37	21.17	5.80
LE-6	16.84	19.96	3.12

**Notes:**

- 1) All depths are reported in feet
- 2) DTW = depth to water
- 3) TOC = top of casing
- 4) NA = not available

**TABLE 2**  
**Soil Analytical Results**  
 Sampled December 20 and 23, 1996 and January 9, 1997  
 Sea World, 1720 South Shores Drive, San Diego, California

Sample ID	Hydrocarbon Range	TPH Screen	TPH <sub>g</sub>	B	T	E	X
LE-1-10	C <sub>22</sub> - C <sub>44</sub>	79	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-1-15	NA	<5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-2-5	NA	<5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-2-10	NA	<5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-3-10	NA	<5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-3-15	NA	<5.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-4-10	C <sub>10</sub> - C <sub>44</sub>	200	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-4-15	C <sub>10</sub> - C <sub>44</sub>	380	<1.0	<0.0050	<0.0050	<0.0050	<0.015
LE-5-10	NA	<5.0	--	--	--	--	--
LE-5-15	NA	<5.0	--	--	--	--	--
LE-6-10	NA	<5.0	--	--	--	--	--
LE-6-15	NA	<5.0	--	--	--	--	--

**Notes:**

All results reported in mg/kg

TPH = total petroleum hydrocarbons; analyzed using EPA 3550/CA DHS Modified 8015

TPH<sub>g</sub> = total petroleum hydrocarbons as gasoline; analyzed using EPA 5030/CA DHS Modified 8015/8020

B = benzene, T = toluene, E = ethylbenzene, X = xylenes; analyzed using EPA 5030/CA DHS Modified 8015/8020

< number = analyte below reported detection limit

NA = not applicable

-- = not analyzed

**TABLE 3**  
**Groundwater Analytical Results**  
 Sampled January 20, 1997 and April 29, 1997  
 Sea World, 1720 South Shores Drive, San Diego, California

Well ID	1,1,1-Trichloroethane	Barium	Selenium	Silver	Zinc
LE-1	6.5	180	<10	85	<50
LE-2	7.2	<50	27	<50	74
LE-3	<2.0	70	33	<50	<50
LE-4	2.4	3,700	26	<50	<50
LE-5	4.8	<50	19	<50	<50
LE-6	2.4	310	45	<50	<50
Basin Plan Water Quality Goal	200 <sup>2</sup>	NL	15 <sup>3</sup>	0.7 <sup>3</sup>	20 <sup>3</sup>

**Notes:**

- 1) All results reported in µg/L
- 2) Basin Plan Groundwater Primary Maximum Contaminant Level, RWQCB, Region IX, 6/94
- 3) Basin Plan Ocean Water Quality Goal, RWQCB, Region IX, 6/94
- 4) NL = Maximum Contaminant Level not listed in Basin Plan
- 5) 1,1,1-trichloroethane by EPA Method 8240, barium, silver, and zinc by EPA Method 200.7, selenium by EPA Method 200.9

**CALIFORNIA COASTAL COMMISSION**

45 FREMONT, SUITE 2000  
SAN FRANCISCO, CA 94105-2219  
VOICE AND TDD (415) 904-5200  
FAX (415) 904-5400



25 January 2004

**GEOTECHNICAL REVIEW MEMORANDUM**

To: Ellen Lirley, Coastal Program Analyst  
From: Mark Johnsson, Staff Geologist  
Re: 6-01-129 Revocation Request (Sea World Splashdown Ride)

With regard to the above-referenced revocation request, I have reviewed the following documents:

- 1) Haz Mat Services 2003, "Public health issues related to toxic landfill gasses at the old Mission Bay Landfill and adjacent property being developed for the Journey to Atlantis ride at Sea World", 6 p. letter to Peter Douglas dated 9 December 2003 and signed by M. Handman (REHS).
- 2) Anheuser-Busch, Inc. 2003, "Analysis of data related to disposal of municipal or hazardous waste at the Journey to Atlantis (JTA) project site", 5 p. letter to Ellen Lirley dated 14 November 2003 and signed by J. Stier.
- 3) Sea World Adventure Parks 2003, "Submittal of dewatering analytical sample results related to construction of Journey to Atlantis at Sea World", 1 p. letter with attachments dated 23 September 2003 and signed by K. J. Carr.
- 4) Sabrina Venskus, Attorney at Law 2003, "Thursday, 10a: California Earth Corps' request and petition for revocation of Coastal Development Permit No. 6-01-129 (Sea World Adventure Park, Splash Down Ride ["RIDE"])", 7 p. letter to Mike Reilly dated 9 September 2003 and signed by S. Venskus.
- 5) Targhee, Inc. 2003, 2 p. letter to Don May dated 9 September 2003 and signed by D. L. Bauer (REA).
- 6) Targhee, Inc. 2003, 4 p. letter to Don May dated 8 September 2003 and signed by D. L. Bauer (REA).
- 7) City of San Diego 2003, "Coastal Development Permit #6-01-129 Revocation Request -- Sea World Splashdown Ride", 5 p. letter to Ellen Lirley dated 28 August 2003 and signed by R. Lafreniere.
- 8) City of San Diego 2003, "Coastal Development Permit #6-01-129 Revocation Request -- Sea World Splashdown Ride", 3 p. letter to Ellen Lirley dated 19 August 2003 and signed by C. Gonaver.
- 9) California Regional Water Quality Control Board 2003, "Coastal Development Permit #6-01-129 Revocation Request -- Sea World Splashdown ride", 4 p. letter to Ellen Lirley dated 18 August 2003 and signed by J. R. Odermatt.
- 10) Department of Toxic Substances Control 2003, 3 p. letter to Rebecca Lafreniere dated 14 August 2003 and signed by E. F. Lowry.

EXHIBIT NO. 2  
APPLICATION NO.  
**6-01-129**

CCC Geologist's

- 11) Protech Environmental Compliance and Safety, LLC 2003, "Air monitoring report, "Journey to Atlantis" construction site", p. report dated 12 August 2003 and signed by K. Kasai (CIH).  
(reviewed excerpts only)
- 12) California Regional Water Quality Control Board 2003, "Reclassification of Mission Bay landfill", 3 p. letter to John Wilks, III dated 4 August 2003 and signed by J. R. Odermatt.
- 13) Sabrina Venskus, Attorney at Law 2003, "Request and petition for revocation of Coastal Development Permit No. 6-01-129 (Sea World Adventure Park, Splash Down Ride)", 7 p. letter to Peter Douglas dated 21 July 2003 and signed by S. Venskus.
- 14) Soil Water Air Protection Enterprise, LLC 2003, "Hydrogen sulfide and methane at Mission Bay Landfill", 3 p. letter to California Earth Corps dated 21 July 2003 and signed by P. Rosenfeld.
- 15) Christian Wheeler Engineering 2002, "Report of preliminary geotechnical investigation, Sea World Atlantis Project, San Diego, California", 32 p. geotechnical report dated 31 May 2002 and signed by C. H. Christian (GE 215) and D. R. Russell (CEG 2225).
- 16) IT Corporation 2002, "Results of soil vapor assessment, Sea World Expansion Plan, 16-Acre Tract", report dated January 2002 and signed by S. C. Haley, W. Nakagawa (PE) and T. J. Mulder (CEG 2123).
- 17) Christian Wheeler Engineering 2000, "Report of preliminary geotechnical investigation, Sea World Atlantis Project, San Diego, California", 28 p. geotechnical report dated 16 October 2000 and signed by C. H. Christian (GE 215) and C. R. Burdett (CEG 1090).
- 18) Christian Wheeler Engineering 2002, "Report of preliminary geotechnical investigation, proposed overflow parking lot expansion project, Sea World Adventure Park, San Diego, California", 9 p. geotechnical report dated 10 October 2002 and signed by C. H. Christian (GE 215).
- 19) LAW Crandall 2000, "Report of geotechnical investigation, proposed Sea World catering facility, 500 Sea World Drive, San Diego, California", 25 p. geotechnical report dated 9 March 2000 and signed by B. E. Crystal (PE 60445), G. F. Rzonca (CEG 1191) and N. G. Schmitt (PE).
- 20) Fluor Daniel GTI 1997, "Assessment Report, Sea World Lease Expansion, 1720 South Shores Road, San Diego, California, HMMS Case No. H21142", 10 p. report dated 9 June 1997 and signed by F. Essig, R. Rheubotto, Kyle S. and A. D. Konzen.
- 21) Groundwater Technology, Inc. 1989, "Supplemental Information for Environmental Audit, Task 3 - Field Investigation, Sea World of California, Inc., 1720 and 1660 South Shores Road, San Diego, California", 10 p. report dated 27 October 1989 and signed by K. S. Gerber and D. Bush.
- 22) Groundwater Technology, Inc. 1989, "Supplemental Information for Environmental Audit, Task 2 - Site Reconnaissance, Sea World of California, Inc., 1720 and 1660 South Shores Road, San Diego, California", 13 p. report dated 17 October 1989 and signed by K. S. Gerber and D. Bush.
- 23) Groundwater Technology, Inc. 1989, "Environmental Audit, Task 1 - Information survey and Task 2 - Site reconnaissance, Sea World of California, Inc., 1720 and 1660 South Shores Road, San Diego, California", 19 p. report dated 15 September 1989 and signed by K. S. Gerber and D. Bush.
- 24) Woodward-Clyde Consultants 1987, "Final report of disposal site information, Mission Bay South Shores Project, San Diego, California", 25 p. geotechnical report dated 3 November 1987 and signed by J. D. Hartley and S. J. Battelle.



25) Woodward-Clyde Consultants 1983, "Site assessment report, Mission Bay Landfill", 123 p. report dated 17 November 1983 and signed by S. C. Haley (RE 18577).

In addition, I have examined a set of aerial photographs submitted to the Commission by California Earth Corps. It is my understanding that Jon Van Coops, the head of the Commission's mapping and cartography section, will be preparing a formal analysis of these photos, and so I will defer that analysis to him. Nevertheless, the examination of these photographs aided me in reaching the conclusions below by providing visual references for the changes at the site described in the references cited. Similarly, I examined numerous other documents submitted by California Earth Corps that did not bear on geologic conditions at the site, but did help provide background that was valuable to me. This review is limited to: the geologic conditions at the Sea World and South Shores sites, the potential for the existence of landfill materials or hazardous wastes, including toxic gases, at the site of the recently permitted Journey to Atlantis (AKA "Splashdown") ride, and the potential that geologic conditions at the Splashdown site could contribute to a public health hazard from gasses that may be present in or near the old Mission Bay landfill.

As you know, the actual location of the permitted Splashdown ride, which is now under construction, is different than the originally proposed location, which lies to the northeast and is much closer to Mission Bay. It is my understanding that the originally proposed location is now to be the location of a catering facility, which was itself originally proposed for the site at which the Splashdown ride is now approved; that is, the locations of the two facilities were switched during as part of the approval of permit CDP 01-129. Throughout this memorandum, I will refer to the site at which the ride was finally approved per CDP-01-129 as the "Splashdown ride site," and the originally proposed location, now the site of the catering facility, as the "originally proposed Splashdown ride site."

References 24 and 25 were undertaken to delineate and describe the Mission Bay landfill in the vicinity of the South Shores Project, which lies east of the Sea World lease holdings in the area of the current boat ramp facility. References 21-23 are environmental site assessments undertaken to evaluate potential environmental concerns on and near the Sea World theme park at the time of purchase of Sea World by the Anheuser-Busch Company. References 15-20 are various environmental and geotechnical reports performed as part of the proposed lease expansion, including the Splashdown ride, approved by the Commission in September 2002 (CDP 6-01-129). Reference 15 specifically addresses the actual location of the Splashdown ride. Reference 13, followed up by reference 4, represents a request for revocation of this permit by California Earth Corps, and is supported by references 5, 6, and 14. Responses to the revocation request by the applicant, City of San Diego, Regional Water Quality Control Board, and Department of Toxic Substances Control make up references 1, 2, 7, 8, 9, and 10. Construction of the ride is well underway, and references 3 and 11 report on ground water and air monitoring that was conducted during construction.

As you know, the grounds for the permit revocation request, as outlined in reference 13, include the allegation that the applicant intentionally withheld reference 16, a soil vapor assessment of a 16-acre tract including the originally proposed Splashdown site, and other, unspecified, studies that the parties seeking revocation claim would indicate that an "unlined and unfenced Class I hazardous waste dump" underlies the Sea World leasehold. Further, the revocation request

alleges that inclusion of any of this information would have caused the Commission to require additional or different conditions on the permit or deny the permit outright. Specific concerns of California Earth Corps include the possible release of hydrogen sulfide gas at the ride site, especially through earthquake-induced liquefaction, and that the Mission Bay landfill might extend further than its mapped boundaries, with the potential that hazardous wastes underlie the ride site. This review does not address the legal issues of the revocation request. It is limited in scope to an evaluation of the potential that the landfill underlies the ride site, the potential for hazardous waste under the ride site, the potential presence of hydrogen sulfide at the ride site, and the potential for the release of hydrogen sulfide at the ride site during construction activities, as a result of a earthquake-induced liquefaction, or other processes. Although I looked for internal inconsistencies and contradictions between the references cited, my review does not extend to validating the actual data presented. I take at face value reported analyses of soil, ground water, and vapor samples, and the mapped distribution of geologic units at the site.

### **Potential for the presence of landfill materials at the Splashdown Site**

The Mission Bay Landfill operated from 1952 through 1959. According to reference 24, wastes were disposed of in trenches 8 to 12 feet deep, which were backfilled when partially filled. The landfill accepted both municipal waste and liquid industrial waste, as was the standard of practice at the time. Documents provided by California Earth Corps, Sea World, and the City of San Diego indicate that this waste included paint sludge, oily wastes, and process solutions consisting of alkali liquids, chromic, hydrofluoric, nitric, sulfuric, and hydrochloric acids, and sodium dichromate. This breakdown is roughly consistent with what is reported in references 20-25; there seems to be no dispute that hazardous wastes were disposed of in the Mission Bay landfill.

Today, such materials would have to be disposed of in a state-approved and regulated Class I facility. Such a facility would have to meet strict siting, design, and monitoring criteria as defined by California regulations. California Earth Corp, and reference 13, refer to the landfill as a "Class I hazardous waste dump." However, it seems clear that the site does not meet the siting, design and monitoring criteria for a Class I landfill, which in any case did not even exist at the time. Nevertheless, the same types of materials that would be disposed of today in a Class I facility apparently were disposed of in the Mission Bay landfill. This is a distinction elaborated upon in reference 12, a letter from the Regional Water Quality Control Board written in response to Sierra Club's request to reclassify the landfill as a Class I facility. This letter states that such a reclassification is inappropriate because current regulations do not classify landfills based upon the nature of waste they received during their operational history, but on a combination of siting and containment system criteria..

Following closure of the landfill in or around 1959, hydraulic fills were placed over the landfill, as well as much of the southern shore of Mission Bay, as part of the dredging of Mission Bay. The thickness of these fills varied, but are as great as 15 feet, as indicated on boring logs in reference 25. These fills consist largely of bay mud. The placing of hydraulic fills ceased in 1962, but mechanically emplaced fills were placed on the site in the 1980's.

The study in reference 25 was undertaken, in part, to evaluate the extent of the landfill, and contains a figure in which the extent of the landfill is inferred. The limits of the landfill were determined on the basis of geotechnical borings (later completed as monitoring wells) and geophysical surveys (magnetic and electromagnetic). It has been acknowledged (e.g., reference 9) that these inferred boundaries are inexact, and it is my understanding that a primary purpose of the Mission Bay Landfill Technical Advisory Committee (TAC) is to better constrain these boundaries. It is significant, however, that landfill debris was easily identified in the borings reported on in reference 25—problems in fully delineating the landfill are, in my opinion, more a function of the number and spacing of geotechnical borings than of any difficulty in identifying landfill materials in such borings.

The southeastern portion of Sea World's leasehold lies within the landfill as mapped in reference 25. Sea World recently proposed the expansion of an overflow parking lot at this location (CDP 6-03-06), which the Commission denied in May 2003. As reported in reference 18, this site was easily identified as being underlain by artificial fill and landfill materials. Competent geotechnical investigations will make clear if a site is underlain by an unmapped extension of the landfill.

In contrast, the geotechnical studies undertaken for the originally proposed Splashdown site (reference 17), and the current site (references 15 and 19) did not find any evidence of landfill materials. Given that landfill materials were easily identifiable in borings from the overflow parking lot site, I feel that the absence of such materials in borings and construction excavations at the both the originally proposed and final Splashdown sites is sufficient evidence that the landfill does not underlie these sites. Further, one of the borings reported in reference 25 lies between the known extent of the landfill and the Splashdown site. No landfill material was encountered in this boring. Finally, construction is already underway at the Splashdown site. Part of this construction involves excavation for the creation of mat foundations. Reference 2 indicates that these excavations are up to 18-24 feet deep, and that no landfill debris, stained soils, or odors was encountered in these excavations.

To summarize, geotechnical borings that penetrate landfill material in the South Shores area clearly indicate the presence of the known Mission Bay landfill. Similar geotechnical borings, and construction excavations for the Splashdown site, do not identify landfill materials at those sites. Although the precise boundaries of the Mission Bay landfill are not accurately known due to the number and spacing of borings, I feel that the borings and excavations undertaken to date at the Splashdown site are sufficient to conclude, with a high level of confidence, that the landfill does not extend beneath the ride site.

#### **Potential for the presence of hazardous wastes at the Splashdown site**

Given the fact that no solid landfill materials have been encountered in borings or excavations at the Splashdown site, I find it unlikely that hazardous wastes underlie the site. It is, however, possible that hazardous waste could have been placed in an excavation or trench that was missed by the borings or foundation excavations for the Splashdown ride. If this were the case they should be detectable in ground water in close proximity to these materials. For example, the

1983 Woodward-Clyde study (reference 25) found elevated concentrations of arsenic, copper, nickel, lead, and zinc, as well as a number of volatile and extractable pollutants in ground water wells located within and near the landfill. The level of these contaminants was, however, less than the California Department of Health standards, and they found no evidence that contaminants were migrating toward Mission Bay or the San Diego river channel. Reference 20 reports on a 1996-1997 Phase I and Phase II Assessment undertaken in the area to the north and east of the Splashdown ride, just north of the mapped landfill boundaries. Such a Phase II study is exhaustive, testing for over 100 chemical constituents. The study found trace levels of some volatile compounds, but these results were either non-reproducible or attributable to sample contamination or laboratory error. Reference 2 presents the results from additional testing at these wells in 2001, and analyses for over 100 contaminants found only trace levels of bis(2-ethylhexyl) phthalate, and these low levels may be attributable to laboratory error. Because construction in the deep excavations at the Splashdown site required dewatering during the construction process, the City required monitoring and analysis of ground water for discharge of this water into the city wastewater stream. Reference 3 presents these analyses, which tested for, but did not detect, benzene, toluene, ethylbenzene, xylene, oil and grease, and lead.

To summarize, no appreciable levels of ground water contamination were found in the area of the Splashdown ride. Thus, it is my opinion that it is very unlikely that hazardous wastes underlie the site.

#### **Potential for the presence and release of hydrogen sulfide at the Splashdown site**

Hydrogen sulfide is produced naturally by the anaerobic decay of organic matter rich in sulfur. It, along with methane, is a common byproduct of both municipal and industrial landfills. During excavation of the Mission Bay landfill for the construction of the boat ramp facility in 1988, a release of hydrogen sulfide occurred and a number of construction workers experienced health effects. One later died, but it is not clear whether or not this was a result of the gas exposure. In any case, this release clearly demonstrates the potential for this landfill to produce high concentrations of this potentially deadly gas.

A soil vapor study (reference 16), undertaken as part of the Sea World lease expansion plan, involved sampling gasses from 28 soil vapor probes spaced on a crude 100 foot grid in the area of the originally proposed Splashdown site and the intervening area between the approved Splashdown ride site and the mapped boundaries of the Mission Bay landfill. This is the report that those seeking revocation of the permit believe was improperly withheld from the Commission and its staff. Portable field meters were used to analyze for methane, carbon dioxide, oxygen, and total organic compounds. Five samples were collected and analyzed in the laboratory for additional gasses, including hydrogen sulfide. At several sample localities, elevated methane concentrations were detected, and at one location (J-24), fifteen feet from the mapped boundary of the landfill, very high levels (1820 ppm) of hydrogen sulfide were encountered at a depth of fifteen feet. This level of hydrogen sulfide would be immediately lethal if a human was subjected to such a concentration in an enclosed space. However, this concentration was encountered in the subsurface and is of unknown volume; the concentration would immediately decrease if vented to the surface and mixed with ambient air by, for example,

ground cracking in an earthquake. Nevertheless, this high level of hydrogen sulfide does indicate the presence of a potential hazard at that location. Hydrogen sulfide was not detectable in one probe location 130 feet away from location J-24, was present at trace levels in a probe about 200 feet away, and was moderate, at 9.41 ppmv, at a location about 340 feet away. This pattern and distribution suggests that the gas may be present in pockets, or in more permeable layers of fill or natural soil at the site. I note that high hydrogen sulfide levels have been encountered only when the landfill itself was excavated during construction of the boat ramp, and at a single probe location that is within fifteen feet of the mapped landfill boundary. At the other locations at which hydrogen sulfide was detected, it was present at relatively low levels. Given the nature of the hydraulic fills at the site, it is likely that the gas encountered at these locations was generated by the anaerobic decomposition of organic matter buried with emplacement of these fills, rather than migration from the landfill.

Reference 2 states that the Department of Toxic Substances Control monitored ambient air in locations in close proximity to location J-24, and presents chemical analyses indicating that these ambient air samples had no detectable hydrogen sulfide.

California Earth Corps has suggested that hydrogen sulfide may move easily through loose, unconsolidated fill at the site and may make possible the release of gas along pilings or foundation elements at the site (reference 13). Further, during a major earthquake the soils at the site may be subject to liquefaction and dynamic compaction, which could result in the sudden release of soil gasses (reference 14). I agree that such a scenario is possible, if unlikely. Because of sand lenses in the native soils that exist at the site (reference 25), the possibility cannot be ruled out that landfill gasses could migrate laterally away from the landfill through these porous media. I agree that compaction and settlement accompanying liquefaction is one process by which such migration could be accelerated.

Nonetheless, there is evidence that such lateral migration of landfill gases has not occurred in the area of the Splashdown ride. During the construction of the foundation excavations for the Splashdown ride, ambient levels of hydrogen sulfide (as well as other gasses) were monitored at the bottom of a 15 foot deep excavation to ensure that levels did not exceed action levels. The results are reported on in reference 11. Several spikes in hydrogen sulfide release were encountered, but these were all far below both the Cal/OSHA and the stricter internal action levels. Further, these spikes were short-lived and occurred infrequently. Reference 11 attributes them to air emissions from construction equipment, or possibly other sources. I concur, but mention that a specific likely "other source" may be pockets of decaying organic matter in the hydraulic fills emplaced at the site.

### **Conclusions and recommendations**

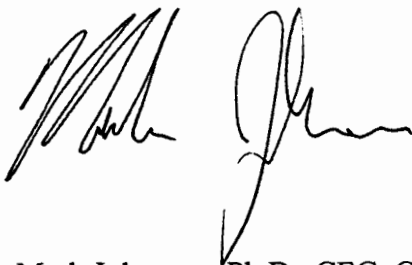
In conclusion, I feel that there is clear evidence that the Splashdown site is not underlain by an unmapped extension of the Mission Bay landfill. The ground water evidence further suggests that the hazardous wastes that almost certainly exist within the landfill have not migrated to the area of the Splashdown ride. They also suggest strongly that no hazardous waste underlies the site. High levels of methane and hydrogen sulfide are associated with the landfill, and it is

possible, but very unlikely, that these gasses could migrate laterally along porous soil layers to the Splashdown site. There is no evidence that this has occurred to date, but dynamic compaction accompanying liquefaction is a possible mechanism to drive such a lateral migration. To my knowledge, no such migration of hazardous gasses has ever been reported during any earthquake.

It is true that more information on soil gasses would have been valuable prior to construction in the vicinity of the actual site of the Splashdown ride; the study reported on in reference 16, although useful for the originally proposed site, did not sample in the right place to address the actual site of the approved Splashdown ride site. However, the fact that no high levels of methane or hydrogen sulfide were encountered during excavation of the ride suggests to me that there is relatively little value in additional passive testing at this date. Given these facts, I feel that it is very unlikely that soil gasses could migrate laterally to the Splashdown ride site, during earthquake-induced liquefaction or otherwise. However, a vacuum extraction test, in which a porous layers are sought out through geotechnical borings, then sampled by applying a vacuum, could provide a more definitive test of that possibility. Finally, because of the known disposal of hazardous wastes at the Mission Bay landfill, the known occurrence of hydrogen sulfide near the landfill, and the lack of definitive information on the precise boundaries of the landfill, I would suggest that additional vapor testing, in which analyses are made for both methane and hydrogen sulfide, be undertaken before any additional construction in the vicinity of the landfill is undertaken.

I hope that this review is helpful. Please do not hesitate to contact me if you have additional questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Johnsson', written in a cursive style.

Mark Johnsson, Ph.D., CEG, CHG  
Staff Geologist





J. Dennis Burks  
Executive Vice President  
General Manager

September 4, 2003

Honorable Chairman Mike Reilly and Coastal Commissioners  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, California 94105-2219

**Re: Revocation Request (CDP No. 6-01-129): SeaWorld Adventure Park  
(SeaWorld) Splash Down Ride; Hearing Date: Thursday, September 11,  
2003; Item: 10a**

Dear Chairman Reilly and Members of the Coastal Commission:

SeaWorld San Diego respectfully requests that you reject the request to revoke SeaWorld's Splash Down Ride coastal development permit. SeaWorld concurs with the staff recommendation that the Commission deny the request for revocation on the basis that no grounds exist for revocation.

As the staff report correctly points out, the grounds for revocation of a coastal development permit are extremely narrow. They include intentional inclusion of inaccurate, erroneous or incomplete information. The party requesting revocation has alleged that SeaWorld failed to provide the Coastal Commission with information related to the Mission Bay Landfill and sensitive species areas. As accurately pointed out in the staff report, these topics were the subject of intense discussion, debate and information during the Commission's deliberation of the SeaWorld Master Plan in February 2002.

The record amply demonstrates that -- contrary to what the parties requesting revocation are asserting -- SeaWorld provided the Commission with voluminous reports about the landfill. As the staff report points out, SeaWorld submitted a binder of reports related to the landfill to the Coastal Commission during the Master Plan review (page 9 of staff report). That binder contained numerous reports related to the existence and status of the landfill.

Additionally, there was no attempt to hide the 2002 Soil Vapor Study (Vapor Study) referenced by California Earth Corps (CEC) from either the Commission or the public. The Vapor Study was furnished to the lead agency for landfill regulation, the City of San Diego Solid Waste Local Enforcement Agency (LEA), on January 7, 2002, and to the Regional Water Quality Control Board (RWQCB) on January 7, 2002. The LEA and RWQCB are the primary regulatory agencies charged with the oversight of the closed landfill.



LETTERS FROM APPLICANT

EXHIBIT NO. 3  
APPLICATION NO.  
**6-01-129**

Letters from  
Applicant

The Vapor Study, conducted at the request of the RWQCB and the LEA, demonstrated that SeaWorld's construction would have no harmful effects on the environment or on the public. In fact, your staff report states that the study is not relevant because the report does not directly address the relocated site of the Splash Down Ride (page 6 of staff report). Your staff has concluded that the data supports the determinations by the RWQCB and LEA overseeing the landfill that the low levels of chemicals detected in the various studies do not represent a significant threat to public health or the environment (page 8 of staff report).

As indicated in the staff report, there is no reason to believe that inclusion of the Vapor Study in the permit review would have led to any different outcome than the Commission's September 9, 2002 approval with conditions. The only additional information in the Vapor Study was an anomalous reading of hydrogen sulfide at one of the test locations. However, the sample was taken at 15 feet underground at a distance of over 300 feet away from the site of the Splash Down Ride, and the Vapor Study ultimately determined that there were no immediate health threats.

Finally, your staff report confirms that the proximity of sensitive habitats was discussed extensively during the Master Plan review.

The record clearly demonstrates that all information relating to the Mission Bay Landfill and sensitive habitats was provided to the Coastal Commission in a timely fashion. SeaWorld, in fact, took extraordinary steps to insure that the Coastal Commission was informed of all the issues by compiling and organizing documents into binders and delivering them for the benefit of the Coastal Commission staff's review. SeaWorld believes that the request for revocation is patently frivolous and wholly without merit and urges the Coastal Commission to follow its staff's recommendation.

Attached for your review is a letter from our attorney further outlining our position with respect to this matter. We respectfully request that you deny the request for revocation.

Sincerely,



Dennis Burks  
Executive Vice President  
General Manager

Enclosure

cc: Ellen Lirley - Via Facsimile (619) 767-2384 and Federal Express  
David E. Watson  
Patrick Owen  
Susan McCabe



HECHT  
SOLBERG  
ROBINSON  
GOLDBERG  
BAGLEY  
LLP

Thu 10a

DAVID E. WATSON  
ATTORNEY AT LAW  
DWatson@nsrqb.com

July 31, 2003

VIA FACSIMILE AND FEDERAL EXPRESS  
(415) 904-5400

Mr. Peter Douglas  
Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, California 94105-2219

**Re: Response to Request and Petition For Revocation of Coastal Development Permit  
No. 6-01-129: SeaWorld Adventure Park ("SeaWorld"), Splash Down Ride**

Dear Mr. Douglas:

This firm represents SeaWorld San Diego in various land use matters, including the processing of the SeaWorld Master Plan ("Master Plan") and individual coastal development permits for the various components of the Master Plan. This letter is in response to the Request and Petition For Revocation of Coastal Development Permit No. 6-01-129 dated July 21, 2003 ("Petition"), submitted on behalf of California Earth Corps ("CEC").

We respectfully urge you to reject the Petition as patently frivolous and without merit because none of the alleged grounds for revocation exist. There is no indication that SeaWorld offered incomplete or erroneous information regarding the permit - either intentionally or otherwise. Moreover, CEC had ample opportunity to fully participate in the original permit proceeding because the potential health threats associated with presence of both methane and hydrogen sulfide on the site of the landfill were well documented prior to the release of the Soil Vapor Assessment in January 2002. Consequently, CEC lacks the requisite standing for requesting revocation.

SeaWorld has been both diligent and forthright throughout the Master Plan approval and permitting process and has, in good faith, expended substantial sums in reliance on the coastal development permit granted in September 2002. As more fully explained below, the Petition should be rejected as patently frivolous and should not be placed on the Coastal Commission's agenda for hearing.

**A. CEC'S PETITION IS PATENTLY FRIVOLOUS AND WITHOUT MERIT.  
THERE ARE NO GROUNDS FOR THE REQUESTED REVOCATION**

The Coastal Commission should not initiate revocation proceedings because there are no valid grounds for revocation of the permit. CEC contends the grounds for revocation are met because SeaWorld intentionally excluded "(1) a technical report indicating hazardous conditions at or near the site, (2) reports and studies documenting an unlined and unfenced Class I hazardous waste dump underlying an unknown expanse of the SeaWorld leasehold, and (3) disclosure of sensitive habitat areas in or near the proposed development, and disclosure of areas of state or federally listed rare, threatened or endangered species." (Petitioner's letter, Section III, page 2.) This argument should be rejected as untrue based upon the record of the Coastal Commission Master Plan and permit process. That record unequivocally shows that the existence of the landfill and its constituents were the subject of numerous reports that SeaWorld furnished to the Coastal Commission during the lengthy Master Plan approval process in 2001 and 2002. In addition, SeaWorld provided the Coastal Commission numerous reports about sensitive habitat areas and endangered species as part of the Master Plan process.

1. The Existence of the Landfill is Well Known and Documented. Incredibly, CEC claims that SeaWorld "knowingly failed to disclose that an industrial Class I hazardous waste dump had been operating in and around the location of the Ride and that the exact boundaries of the toxic hazardous waste dump were unknown." (Petitioner's letter, Section III(B), page 3.)

When the Coastal Commission certified the SeaWorld Master Plan in February 2002 and adopted the Master Plan findings in April 2002, the Mission Bay landfill was a major point of discussion. Numerous public speakers discussed the landfill. The Coastal Commission staff reports dated January 24, 2002 and March 20, 2002 for the SeaWorld Master Plan discussed the landfill at length. The Coastal Commission was fully informed about the landfill issues.

The Coastal Commission also received the Master Plan Environmental Impact Report ("EIR") as part of the Master Plan approval process. The EIR discussed the inactive landfill and potential health risks associated with the landfill at length, noting that the landfill site has been the subject of several studies before and after its closure. The EIR also analyzed sensitive habitat areas and endangered species. The following studies, reports and activities relating to the landfill were expressly referenced in the EIR:

- The U.S. Environmental Protection Agency ("EPA"), the Regional Water Quality Control Board ("RWQCB"), the California Department of Toxic Substances Control ("DTSC"), the City of San Diego ("City"), the County of San Diego Environmental Health Department ("EHD") and Air Pollution Control District ("APCD") were all involved in the monitoring and regulating the closure of the landfill and Phases I, II and III of the South Shores Development Project.

Mr. Peter Douglas

July 31, 2003

Page 3

- Under contract with the City, Woodward Clyde Consultants submitted a summary of a comprehensive investigation into the extent and hazardous waste content of the Mission Bay Landfill in 1983. As result of the study, the RWQCB (by Order 85-78, September 16, 1985) established periodic sampling of groundwater within the landfill, plus surface water and sediment sampling of Mission Bay and the San Diego River.
- A Site Inspection Prioritization ("SIP") for the landfill site was completed by Bechtel in 1993 for the EPA.
- Fluor Daniel GTI ("GTI") conducted a Phase I and Phase II investigation on the landfill site in December 1996 and January 1997. The study included drilling six wells on the northeast portion of SeaWorld's leasehold.

To insure thorough Coastal Commission review of the landfill during the Master Plan approval process, SeaWorld delivered to the Coastal Commission staff additional reports and studies, including the City of San Diego Post-Closure Land Use Plan for Mission Bay South Shores, Phase III. The presence of both methane and hydrogen sulfide on the site of the landfill was acknowledged in these reports and studies.

Moreover, there were more than twenty public comments and responses in the EIR addressing potential health and safety issues related to the landfill, including comments from the Department of Toxic Substances Control, RWQCB, Midway Community Planning Board, Peninsula Community Planning Board, Save Everyone's Access, Loma Riviera Community Association, Ocean Beach Grassroots Organization and Mission Bay Park Toxic Cleanup. A number of these comments refer specifically to the presence of hydrogen sulfide on the site of the old landfill.

Consequently, the Coastal Commission was fully aware of the potential issues relating to the landfill when it voted to certify the Master Plan in February 2002 and adopted the findings related to the Master Plan in April 2002.

The Splash Down Ride coastal development permit was approved in September 2002—based on the Coastal Commission findings and certification of the Master Plan earlier that year. The Coastal Commission staff report, dated August 19, 2002, for the Splash Down Ride states: "The splash down ride is a Tier 1 project, and has been described in detail in the master plan. An EIR was prepared, circulated for public review and approved by the City of San Diego for the master plan, which looked at the overall plan but also analyzed potential impacts and mitigation measures for the identified Tier 1 projects." As stated above, the landfill was analyzed thoroughly in the EIR.

The Splash Down Ride was part of the Master Plan certified in February 2002. Approving the Ride's coastal development permit in September 2002 implemented the previously certified Master Plan. All information related to the Master Plan approval process was part of the Coastal Commission's deliberations

Mr. Peter Douglas

July 31, 2003

Page 4


for the Splash Down Ride. California courts have held that administrative agencies are presumed to have considered previous evidence on a related matter. An administrative agency "must in reason be presumed to have considered its earlier studies, reviews and reports . . . as well as such evidence as was initially produced at the hearings. The validity of such studies, reviews and reports did not depend upon their being "presented" anew . . ." *City of Santa Cruz v. LAFCO*, (1978) 76 Cal.App.3d 381, 392.

SeaWorld provided the Coastal Commission voluminous information regarding the landfill, sensitive habitats and endangered species during the Master Plan approval process. The Coastal Commission relied on its approval of the Master Plan and the information provided then for its approval of the Splash Down Ride. No information related to the landfill, sensitive habitats or endangered species was withheld either from the Coastal Commission or the public during the Splash Down Ride approval process.

2. The January 2002 Vapor Study has been in the Public Record Since January 7, 2002. CEC alleges that SeaWorld intentionally withheld the Vapor Study from the Coastal Commission when the permit was approved in September 2002. This is simply not the case. The January 2002 report was furnished to the lead agency for landfill regulation, the City of San Diego Solid Waste Local Enforcement Agency ("LEA"), on January 7, 2002, and to the RWQCB on January 7, 2002. These two entities are the primary regulatory agencies charged with the oversight of the closed landfill. Certainly there was no attempt to hide this report from the Commission or the public.

The Splash Down Ride is not on the landfill site and does not disturb the landfill, therefore, the study is not relevant to the Ride. However, the study demonstrated that the landfill posed absolutely no health risk for SeaWorld's proposed development near the landfill.

The Vapor Study was prepared by IT Corporation ("IT Corp.") at SeaWorld's request in order to document soil vapor data collected from the 16-acre tract of the proposed SeaWorld development. Although the Splash Down Ride development does not encroach upon the waste-fill area of the closed landfill, the work was commissioned to assess the migration of landfill gas from the landfill to the overall Master Plan development area and to determine the nature and extent of detectable soil gas parameters of concern. In October 2001, IT Corp. installed temporary soil vapor probes at 28 locations in and around the waste-fill area of the closed landfill. Elevated methane concentrations were observed at some of the sampling locations. No field methane concentrations greater than 0.5% were found at distances greater than 400 feet from the landfill, and all methane concentrations greater than 5% were observed within 300 feet of the approximate edge of the landfill. No individual volatile organic chemicals ("VOCs"), such as the halogenated VOCs present in degreasers, solvents and oil aerosol propellants and petroleum VOCs, were detected in any of the samples. This suggests that the source of the methane is the decomposition of buried green waste or fill soil containing a relatively high organic content, rather than typical municipal solid waste. The methane detected in the soil vapor immediately adjacent to the landfill is routinely found, monitored and mitigated in developments in southern California near landfills and can be properly addressed in future development at SeaWorld using common engineering practices.



Mr. Peter Douglas  
July 31, 2003  
Page 5

With respect to the data on hydrogen sulfide, IT Corp. did detect elevated levels of this compound at one of the sampling locations, the site labeled J-24. However, in terms of the alleged public health hazard, it should be noted that the 1,820 parts per million reading of hydrogen sulfide was taken 15 feet underground and 315 feet away from the project site. Moreover, there was no reading of any hydrogen sulfide gas in the four test wells between test well J-24 and the project site. Therefore, as suggested in the Vapor Study, this reading was likely an anomaly, probably constituting a small pocket of gas which is not atypical for a landfill.

It is important to note that the original permit application was filed on August 8, 2001, several months before the report in question was in existence. At the request of the Coastal Commission, SeaWorld re-filed the permit application in May 2002, but only to change the location of the Splash Down Ride consistent with the Commission's required change of location when it certified the Master Plan. The fact that the permit application was filed prior to the completion of the Vapor Study belies CEC's assertion that SeaWorld intentionally withheld information. CEC further asserts that the alleged intent to withhold information is evidenced by SeaWorld's response to Question No. 8 in the permit application. However, Question No. 8 addresses the grading of the project site -- not the environmental condition of property 315 feet away. It is disingenuous and frivolous for the CEC to allege SeaWorld "intentionally included inaccurate information" by failing to include a report that has nothing to do with grading or the project site. In fact, SeaWorld's application did identify its geotechnical report.

**B. CEC LACKS THE REQUISITE STANDING TO FILE A PETITION FOR REVOCATION UNDER CALIFORNIA CODE OF REGULATIONS SECTION 13106.**

The CEC had an opportunity to fully participate in the original permit proceeding. CEC also is fully aware of the Master Plan proceedings, as indicated in the Petition. The presence of methane and hydrogen sulfide on the site of the landfill has been well documented in the various reports and studies on the landfill and in the Master Plan EIR. Given the extensive number of reports and studies on the closed landfill, it is difficult to understand how CEC believed that the Vapor Study raised new health and safety concerns that were not previously addressed by the earlier reports and studies. Because such information was already in the public record, CEC had a full opportunity to address such concerns when the item was heard last September. As such, CEC cannot satisfy the threshold requirement for requesting a permit revocation.

**C. FINANCIAL IMPACTS**

If the Coastal Commission requires SeaWorld to stop construction on the Splash Down Ride based upon the petition, SeaWorld will suffer significant and potentially irreparable harm. The Splash Down Ride is approximately two-thirds complete. If the project is delayed six weeks, the damages for de-mobilization

Mr. Peter Douglas  
July 31, 2003  
Page 6

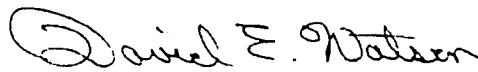
and re-mobilization of the construction crews are estimated to be \$1.6 million. The economic impact to SeaWorld for a delayed opening of six weeks is approximately \$1.3 million. If the permit is revoked, SeaWorld would lose \$22 million in construction costs already incurred, in addition to \$5 million in demolition costs. Other effects on the local area include approximately \$350,000 in lost annual rent payments to the City of San Diego and \$225,000 in annual utility payments for power, water and sewer services if the project was stopped.

### CONCLUSION

CEC's petition is patently frivolous and without merit. All landfill, sensitive habitat and endangered species issues related to all SeaWorld development have been discussed publicly at hearings and in environmental documents related to the SeaWorld Master Plan for the last two years. No information was withheld, and a review of the Coastal Commission's written record shows that CEC's petition is without merit on its face. In addition, CEC cannot now make any claim to the Coastal Commission because CEC had ample opportunity to participate in the original permit proceeding.

We respectfully request that you reject the Petition. Thank you for your consideration.

Very truly yours,



David E. Watson

HECHT, SOLBERG, ROBINSON, GOLDBERG & BAGLEY LLP

DEW:nsh:set

cc: Ellen Lirley - Via Facsimile (619) 767-2384 and Federal Express  
Dennis Burks  
Patrick Owen  
Susan McCabe



RECEIVED  
DEC 22 2003  
CALIF.  
COASTAL COMMISSION

December 9, 2003

Mr. Peter Douglas  
Executive Director  
California Coastal Commission  
45 Fremont Street, Suite 2000  
San Francisco, California 94105-2219

Re: Public health issues related to toxic landfill gases at the Old Mission Bay Landfill and adjacent property being developed for The Journey to Atlantis ride at SeaWorld

Dear Mr. Douglas:

Due to my unique work experience with the Old Mission Bay Landfill in the late 1980's, I have been retained by SeaWorld, Inc. to provide comments on the public health implications of the potential exposure to Hydrogen Sulfide and other toxic landfill gases impacting the Journey to Atlantis ride (JTA).

Currently, I am an independent environmental and hazardous materials consultant specializing in environmental health/hazardous materials training and hazardous chemical emergency response. I hold bachelors and masters degrees in environmental biology, occupational and environmental health, and a California secondary teaching credential. I am also a California Registered Environmental Health Specialist (REHS) and a California Certified Hazardous Materials Specialist. I am an adjunct instructor for the University of California San Diego in their Sciences and Engineering Extension Program. I have worked in the environmental field as a practicing industrial hygienist, environmental health and hazardous materials specialist for 30 years. Until my retirement in March of 2003, I managed the County of San Diego's Chemical Emergency Response Unit in the Hazardous Materials Division of the Department of Environmental Health. I was responsible for the unit's Hazardous Incident Response Team (HIRT) and was an emergency planner for the department and the County. I coordinated HIRT and other emergency planning responsibilities with fire, law enforcement and other environmental regulatory agencies on the local, state and federal levels.

During my tenure with the County of San Diego, my principal responsibility was to perform hazardous chemical identification assessments and public health risk appraisals mostly during emergency situations. I have been the principal investigator conducting public health risk assessments on at least 5,000 chemical release investigations throughout San Diego County in the last 25 years.

6311 Lake Dora Ave.  
San Diego, CA 92119-3128

619.987.4713 mobile  
619.463.4220 landline

hazmatmike@cox.net

I have reviewed the environmental studies and interested parties' comments/responses resulting from construction of the JTA ride. My comments focus on the potential public health risks associated with Hydrogen Sulfide and other toxic landfill gases that may be present in the hydraulic fill at the Old Mission Bay Landfill (OMBL), SeaWorld's JTA ride, and the adjacent parking area.

Most of the opponent's correspondence suggests that toxic gases which may be present in the landfill, are increasing the public's exposure risk during the Journey to Atlantis ride. This conclusion is principally based on the discovery of  $H_2S$  in one well (J-24, IT, January 2002) and the exposure to construction workers excavating a boat-launching ramp in 1988.

## Overview

The presence of an elevated concentration of  $H_2S$ , in this case discovered 15 feet below the surface in only *one* soil vapor sampling well out of a total of 28, does not by itself constitute any existing or potential public health problem. The key issue for the JTA project is *not* the hazard characteristics of  $H_2S$ , but rather the potential for the public to be **EXPOSED** to the gas through inhalation in concentrations above the acute injury threshold. Additionally, such a release into an open air environment must be continuous to exceed an  $H_2S$  concentration above 50 ppmv (parts per million volume), which is high enough to cause irritation based symptoms in the public (OHM/TADS, 1999; Lewis, 1996; Ellenhorn, 1987; Hathaway, 1996; ACGIH, 1992). The ride is more than 300 feet from the only significant subsurface  $H_2S$  source, and prevailing wind conditions generally exceed 4 mph. The JTA site is upwind from this well and the landfill purported to be an additional source of airborne  $H_2S$ . Significant dilution of any air-borne contaminate, especially  $H_2S$ , released from this hydraulic fill with limited soil vapor space cannot produce concentrations of gas in ambient air that would affect the general public. Additionally, the ride itself is several stories above ground and is *not* constructed in a confined or unventilated structure where  $H_2S$  would concentrate. The environmental history of subsurface toxic gases at the OMBL and the parking area at the JTA construction site supports the conclusion that  $H_2S$  will not adversely affect the public. With the exception of the 1988 report of the exposed construction workers grading the landfill and the complaint recently made to the State Department of Toxic Substance Control, *no other complaints or exposures* from toxic gases have been documented in the public record.

## Environmental Evaluation/Sampling Reports

If we examine the most recent comprehensive soil vapor sampling record (Soil Vapor Assessment IT- January 2002), the only indication toxic gases are present in concentrations of public health significance (greater than 10 ppmv) is the subsurface results from the **J-24** well sample from that study (1820 ppmv  $H_2S$ ). This sample was taken with a soil gas vapor probe in a closed system with a hydraulic top cover of fifteen feet, where no ambient air was being introduced. J-24 is located over 300 feet away from the JTA site. This sample was taken in hydraulic fill that was outside of the known boundary of the OMBL. Adjacent soil vapor samples J23-J27 (IT, January 2002, figure 4) and well samples taken by the city do not indicate the presence of  $H_2S$ . It is reasonable to conclude that subsurface  $H_2S$  concentrations, if present, are quite localized and limited in volume. Limited volumetric concentrations of gaseous  $H_2S$  in the soil pores are typically due to the bacterial conversion of organic sulfur containing materials found in the hydraulic top cover (HSDB, 1999). The vapor pressure of  $H_2S$  is  $1.56 \times 10^4$  mmHg (HSDB, 1999). Once released to the surface through disturbances, cracks or excavations in the hydraulic fill top cover, the gas would immediately be



diluted and dissipate in the ambient wind found at the site. Analytical data supporting this outcome is found in the now finalized JTA complaint investigation report conducted by the Department of Toxic Substance Control (DTSC). Ambient air samples were first taken on August 20, 2003 directly above and in the immediate area surrounding the J-24 (IT, January 2002) vapor well site and the JTA construction site. Air monitoring was conducted using direct reading air monitoring instruments (TMX 412 and Passport Five Star) specifically designed to sample for combustible vapors and Hydrogen Sulfide in air. Additionally, ambient air-breathing zone samples were taken on August 21, 2003 using five six-liter stainless steel Summa canisters. Sample locations were placed on the J-24 (IT, January 2002) soil well and at 6 feet intervals north, south, east and west of the well. Air samples captured in the Summa canisters were taken to an approved analytical laboratory and analyzed for H<sub>2</sub>S. DTSC responded in their letter to the complainant dated November 26, 2003 that "the air monitoring results of August 20, 2003 indicated no detectable levels of hydrogen sulfide gas." "Furthermore, there were no variations in the normal oxygen readings that would imply other gases were present. The five air samples analyzed at a state-certified laboratory were non-detect for either reduced hydrogen sulfide compounds or methane gases (DTSC letter to John Wilks and Scott Andrews, November 26, 2003)."

Sabrina Venskus, Attorney at Law, (letter dated September 9, 2003 Section II) states "Table Two [IT Soil Vapor Study, 2002] shows that shallow tests (taken at 5 foot depths) in various wells contained a distinguishing sulfur odor, indicating the presence of H<sub>2</sub>S gas throughout the Study area." The top cover of the OMBL, as well as the clean hydraulic fill covering most of Mission Bay, originated from dried sewage sludge or other materials high in organic materials that contain sulfur compounds produced by bacterial decomposition. It is quite common to encounter a musty odor or the smell of organic decay in these sediments once opened to the atmosphere, but such smells do not automatically indicate the presence of toxic substances, including Hydrogen Sulfide. Equating these types of odors with an H<sub>2</sub>S exposure concentrated enough to create a public health problem is unsupported by the historical record at Mission Bay. Additionally, the odor threshold of H<sub>2</sub>S in air is 0.02ppb - 0.13ppm (Budavari, 1996; HSDB, 1999), with a characteristic rotten egg smell. This concentration is approximately 750-5000 times *below* the Immediate Dangerous to Life and Health Value (IDLH), which would cause injury or death from H<sub>2</sub>S.

## Engineering and Construction Controls

The Local Enforcement Agency (LEA), in accordance with Title 27, has required SeaWorld to install a variety of engineering controls and monitoring equipment to detect and manage combustible gas inside buildings on the JTA site. Ventilation of enclosed spaces will be managed with HVAC systems that are designed to control the buildup of landfill gases in any below grade JTA structures. Combustible/Hydrogen Sulfide gas monitors with visual and audible alarms will be installed to continuously monitor all buildings where those gases might intrude. All alarms above safety thresholds must be immediately reported to the LEA. Construction safeguards include high-density concrete structures with waterstop cold joints and Volclay waterproofing panels beneath the slab foundations and subgrade walls to prevent water intrusion and retard landfill gas (Post Closure Land Use Plan for the JTA; Section 1.4.3-1.4.6). As an additional precaution, the LEA for the City of San Diego has required the installation of three monitoring wells strategically located between the boundary of JTA and the Old Mission Bay Landfill. These wells will be used to detect any sub-surface H<sub>2</sub>S that potentially could migrate onto the JTA site and act as an early warning system for the ride operators. In my opinion the engineering, administrative, and environmental monitoring

controls required by the LEA are substantially more than adequate and will ensure that no public exposure to toxic landfill gases will occur.

## Old Mission Bay Landfill ~ Worker Exposure Response

In October of 1988, I was the supervisor in charge of the field response and subsequent investigation conducted for the reported Hydrogen Sulfide exposure to the construction workers (HIRT report, 1988-478). I was on scene and took many of the direct reading air monitoring measurements to identify the potential air contaminants the injured workers were potentially exposed to while excavating the top cover of the landfill. The Environmental Health HIRT unit was on scene within 30+ minutes of the exposure complaint, which was received by HIRT dispatch from officials at the hospital who treated the exposed workers. It should be noted that at the time of the on scene field investigation, air sampling was conducted in the graded pit and directly over the points where surface grading into the landfill cover was made by the operator of the tractor. At that point no evidence of trash was indicated and the soil appeared to consist of the hydraulic fill typical of the area. Air sampling was conducted using direct reading air monitoring instrumentation which included a United Technologies Hydrogen Sulfide meter with a detection limit of +/- 1ppmv, a Tegal Scientific Photoionization Detector, and a Drager colorimetric indicator pump with detector tubes specific for low concentrations of Hydrogen Sulfide. Samples were taken in air directly above the area of concern and from soil placed in a plastic bag directly removed from the cuts and pit made by the tractor. Results were non-detect for Hydrogen Sulfide in all the air monitoring samples taken that day. The distinct odor of sulfur also was not present at the time of the sampling in any of the graded sediments. ***The claim that the driver of the tractor had died several weeks later from acute Hydrogen Sulfide poisoning has no basis in fact.*** The death certificate indicates that natural causes unrelated to landfill gases were responsible for that individual's death. At the time, I was told by his employer that he had a heart attack. Further, examination of the complaint history of the Old Mission Bay Landfill received by the County of San Diego Department of Environmental Health covering the past 20+ years, will show no record of Hydrogen Sulfide exposures other than the initial complaint on October 6, 1988. The complaint records extend back to 1981.

## Conclusion

A review of the existing analytical studies, soil vapor assessments, post closure use plans, and the JTA engineering construction requirements in Title 27 regulations, clearly indicates that toxic gases at the Journey to Atlantis site have not and will not present a public health problem. Review of the historical complaint and emergency release reports, dating back to 1983 and available from public regulatory agencies, also confirms that toxic gases have not been a problem for anyone at the Old Mission Bay Landfill. Recent ambient air monitoring conducted by the Cal/EPA Department of Toxic Substance Control also establishes that H<sub>2</sub>S is not present at the Journey to Atlantis ride construction site. Additionally, the supposition that H<sub>2</sub>S or other toxic gases were the cause of death for a construction worker grading the landfill in 1988 is pure speculation and is not supported by any facts ascertained at the time of the exposure. Based on available data and the proposed engineering and administrative safeguards for H<sub>2</sub>S and Methane designed for the JTA ride, revocation of the

construction permit, in my professional opinion, is wholly unjustified and is not supported by the scientific or public health record.

Respectfully,



Michael Handman, M.S., R.E.H.S.  
MH Hazmat Services

### References

ACGIH: **Threshold Limit Values and Biological Exposure Indices for 1989-90**. American Conference of Government Industrial Hygienists Inc, Cincinnati, OH, 1989.

Budavari S (Ed): **The Merck Index**, 12<sup>th</sup> ed. Merck & Company, Inc, Whitehouse Station, NJ, 1996, p 823.

Department of Toxic Substance Control: Letter to John Wilks III and Scott Andrews. November 20, 2003.

Ellenhorn MJ: Hydrogen Sulfide, in: **Ellenhorn's Medical Toxicology: Diagnosis and Treatment of Human Poisoning**. Elsevier, New York, NY, 1988.

Hathaway GJ, Proctor NH & Hughes PP et al: Hydrogen Sulfide, in: **Chemical Hazards of the Workplace**, 4<sup>th</sup> ed. Van Nostrand Reinhold Company, New York, NY, 1991, pp 339-340.

Hazardous Materials Incident Response Team: **Hazardous Materials Incident Response Report**, HIRT Report Number 1988-478, County of San Diego, Department of Environmental Health, 1988.

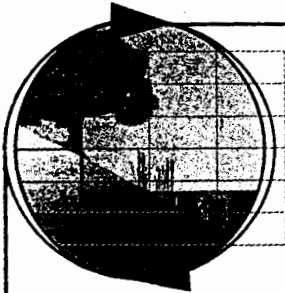
HSDB: **Hazardous Substance Data Bank**. National Library of Medicine, Bethesda, MD (CD – ROM Version), Micromedex, Inc, Englewood, CO, 1999.

IT Corporation, **Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract**. Project Number 830418, January 2002.

Lewis RA (ED): Hydrogen Sulfide, in: **Lewis' Dictionary of Toxicology**. Lewis Publishers, Boca Raton, FL, 1996, p 579.

**OHM/TADS: Oil and Hazardous Materials/Technical Assistance Data System.** United States Environmental Protection Agency, Washington, DC (CD-ROM Version), Micromedex, Inc. Englewood, CO, edition expires 01/31/99.

**URS: Demonstration of Compliance with Title 27, Section 21190, For the Journey to Atlantis Amusement Ride.** Project Number 27703043.02000, March 2003.



## **Merkel & Associates, Inc.**

5434 Ruffin Road, San Diego, CA 92123

Tel: 858/560-5465 • Fax: 858/560-7779

e-mail: associates@merkeline.com

**RECEIVED**

January 29, 2004  
M&A # 00-016-07

JAN 29 2004

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Mr. Patrick Owen  
SeaWorld Adventure Parks  
500 SeaWorld Drive  
San Diego, CA 92109

### **Re: Assessment of Aerials of Landfill Area East of SeaWorld**

Dear Mr. Owen:

In response to your request, this letter provides an assessment of the aerial photos addressed in the Targhee, Inc. letter dated September 8, 2003. Merkel & Associates has reviewed the Rozelle photos, and others of the era, and has provided comments and an analysis of what activities we believe are reflected in the photos. This analysis focuses on the Mission Bay Park construction dredging activities, and their affect on lands in the vicinity of SeaWorld and the South Shores portion of Mission Bay Park.

Mission Bay Park, as it is today, was created through multiple years of hydraulic dredging and filling of the mudflats, wetlands, waterways, and alluvial areas of the once expansive False Bay wetland complex. Dredge and fill work began in the western portion of Mission Bay and moved progressively eastward. Prior to the creation of the current San Diego River Flood Control Channel, the old natural meandering channel of the San Diego River flowed into the southeast portion of the Mission Bay marsh, through what is now South Shores Basin.

The Mission Bay landfill, located on the north side of the north dike of the San Diego River Flood Control Channel within Mission Bay, began operations in July 1952. By November 1956 (photo 82:13673-1352) dredge work within Mission Bay was progressing in Quivira Basin and in Perez Cove. By December 1957, a sand berm was created along the south shoreline of what is now the South Pacific Passage. Additional berms were created along the north side of the flood control channel dike (west of the landfill) and along an area east of Ingraham Street (photo 82:13673-1437). The purpose of these berms was to create a basin into which hydraulically dredged material from other portions of Mission Bay could be deposited. SeaWorld is currently located within the western portion of this basin area. A discharge pipe was placed beneath Ingraham Street and into the western edge of the basin, and hydraulic fill from dredging operations was pumped into the western portion of the basin. A mix of hydraulically pumped sediment slurry is visible in photo 82:13673-1437, and the western portion of the created basin is flooded. The photo also shows the location of a cut in the created berm through which decant water could exit the basin via the historic San Diego River channel through the remaining Mission Bay marshlands.

The approach to dredging and hydraulic fill observed near the Mission Bay landfill in the 1950s is typical. The establishment of sand berms in precise locations allows for containment of discharge from dredging activity. Typically, coarser, sandier sediments settle quickly and are deposited relatively close to the source of input (dredge pipe). Finer sediments remain suspended in water and are typically carried further from the discharge point. Once sediments have settled, water is allowed to drain from the created basin back into the main waterbody through an established cut or break in the containment berms. Water flow within the created basin is unidirectional and proceeds from the point of discharge to the point of drainage. Larger basins have longer residence times and slower velocities for water, which increases settling time for suspended sediments; however, water flow within the basin remains unidirectional. In the case of the Mission Bay dredging project near the landfill, water flow and sediment deposition within the created basin proceeded from west (where the dredge pipe was located) to east (where the cut in the berm allowed dredged water to decant back into Mission Bay).

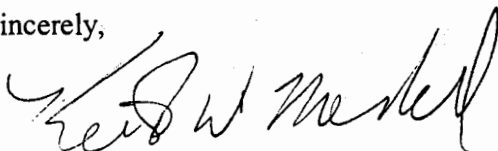
Additional photos show the progression of dredge and fill activities within Mission Bay. Photos 82:13673-1587 and WCC 67, taken in November 1959, show the continued placement of fill material within the created basin near the landfill. At this time, the sand berms remained along the Southwest Passage. In addition, the southern shoreline of Fiesta Island was under construction. By February 1961 (photos 82:13673-1804 and -1827), the outline of Fiesta Island was completed and the center of the island was under construction. The created basin around the landfill was reduced in size as the basin was filled from the west. In Photo 82:13673-1827, a large area of sandy fill is apparent within the west side of the basin, near the current location of SeaWorld. The cut in the eastern side of the berm was still in place, allowing for continued west to east water and sediment flow within the basin.

By December 1961 all of the major dredging with Mission Bay appears to have been completed. Photo 82:13673-1873 shows the extent of the completed filled basin on what was once the Mission Bay landfill. The white mounds visible in the photo are discharge points for hydraulic material, that were created as the dredge pipe was moved from west to east within the basin, and a cap of coarser, sandier sediments was deposited over the initially deposited finer sediments.

In conclusion, it is apparent from this series of historic photos of Mission Bay, that hydraulic fill activities within the basin created in the vicinity of the landfill proceeded along a west to east gradient. As a result, any contaminants present in the landfill sediments are not expected to have moved into the SeaWorld site, but rather if they were translocated at all, the expected gradient would have been to the northeast, in alignment with discharge of the decant water from fill placement. It is, therefore, not anticipated that the sediments beneath SeaWorld were contaminated as a result of dredging activities.

It is our opinion that the photos do not indicate evidence of contaminant spread as suggested in the Targhee Inc. letter.

Sincerely,



Keith W. Merkel  
Principal Consultant

Photo 82:13673-1352 (November 1956)

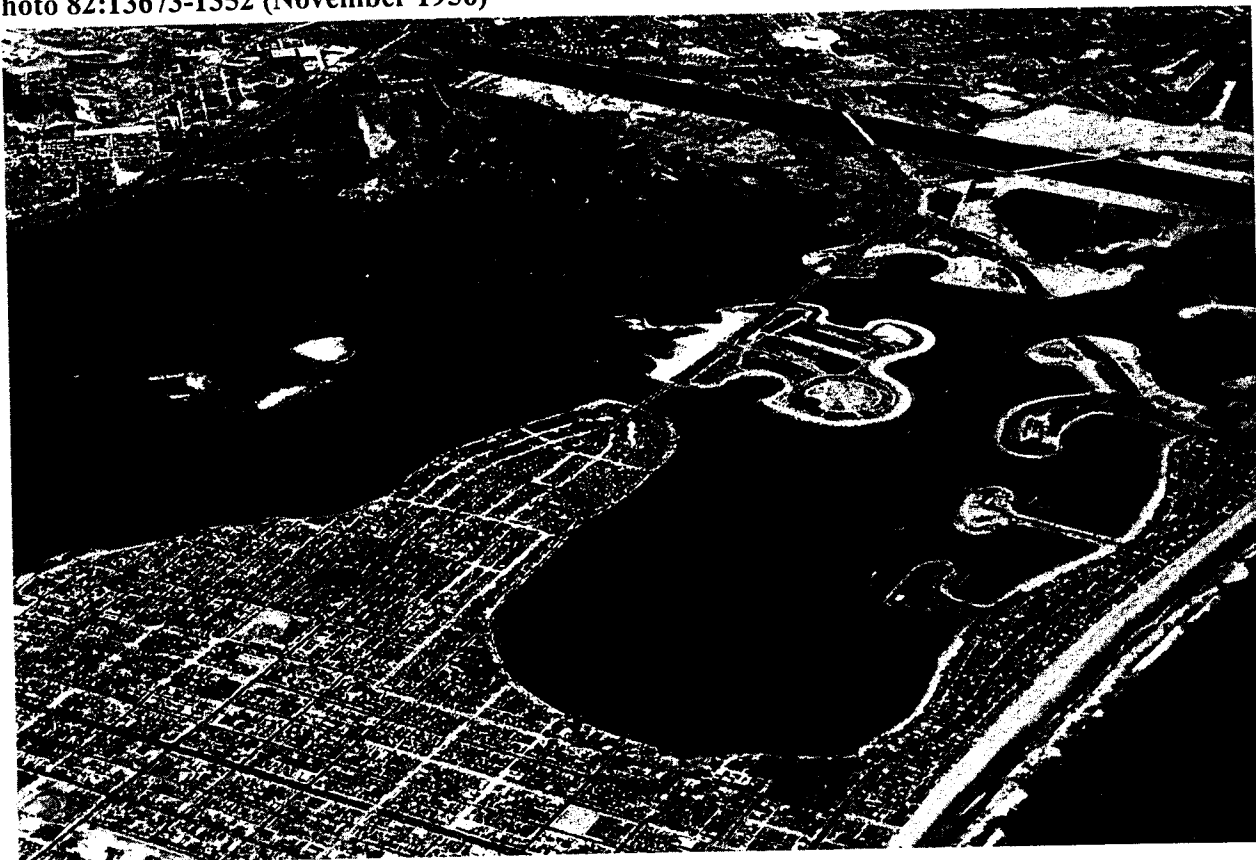
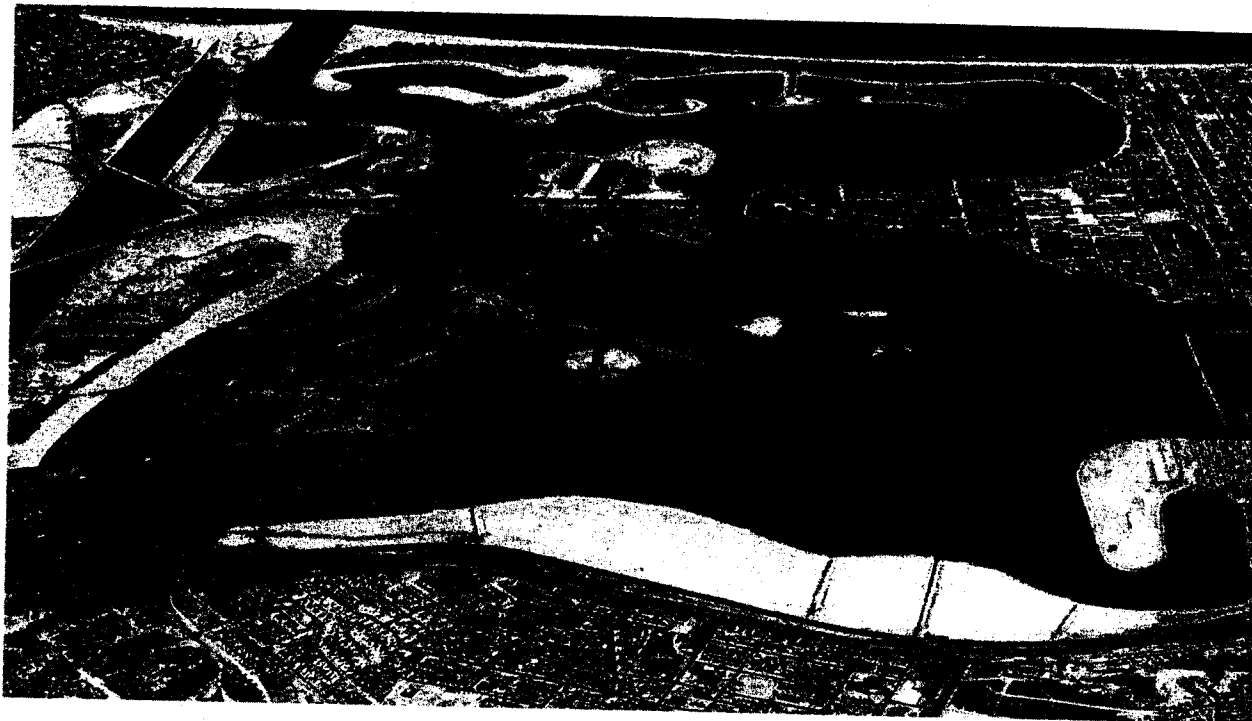


Photo 82:13673-1437 (December 1957)



Photo 82:13673-1587 (November 1959)



WCC67 (November 1959)





Photo 82:13673-1804 (February 1961)



Photo 82:13673-1827 (February 1961)

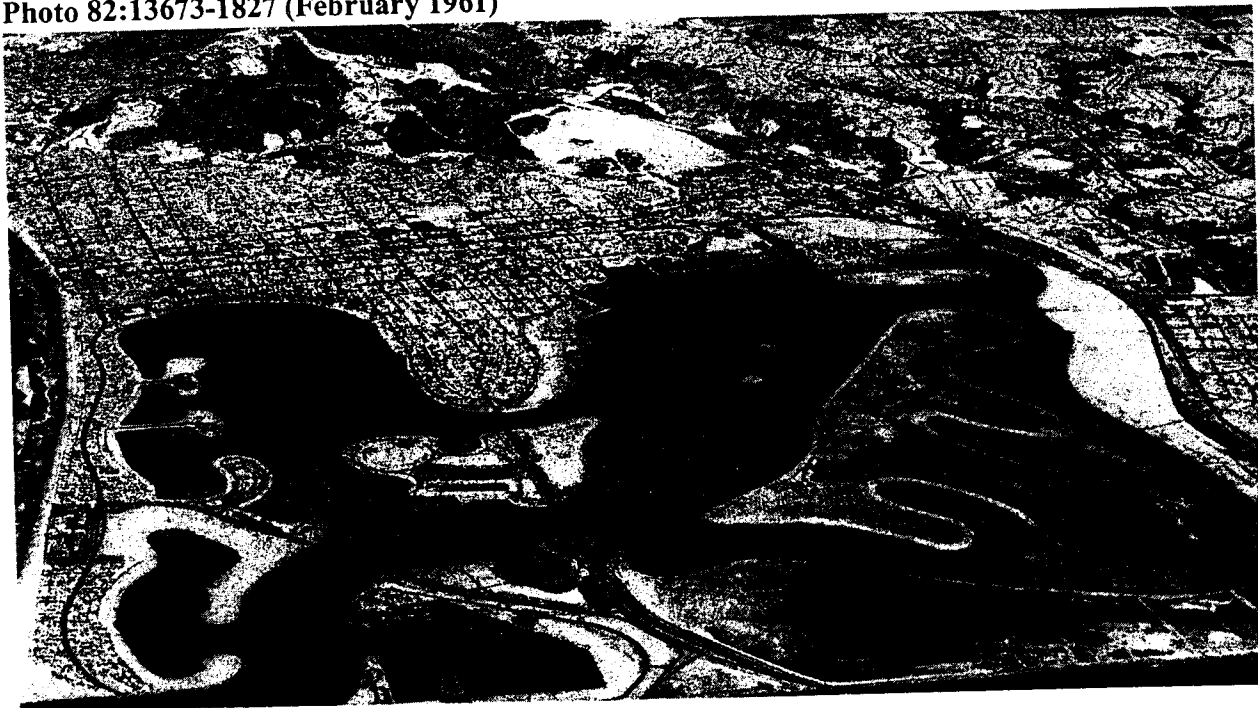


Photo 82:13673-1873 (December 1961)





THE CITY OF SAN DIEGO

August 28, 2003

RECEIVED

SEP 02 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Ellen Lirley, Coastal Planner  
California Coastal Commission  
San Diego Area  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4402

Subject: Coastal Development Permit #6-01-129 Revocation Request – SeaWorld  
Splashdown Ride

Dear Ms. Lirley:

The City of San Diego Solid Waste Local Enforcement Agency (LEA) is certified by the California Integrated Waste Management Board to enforce state solid waste laws and regulations at solid waste sites including closed landfills. The LEA received your inquiry dated August 13, 2003 regarding its role and jurisdiction over the proposed SeaWorld Splashdown Ride and the Mission Bay Landfill. In addition, you requested specific responses to three bullets.

LEA Role and Responsibilities

The LEA enforces:

- State Law: Public Resources Code (PRC), Division 30. Waste Management.
- State Regulation: Title 27 Environmental Protection, California Code of Regulations, Division 2. Solid Waste (27CCR).  
Title 14, Natural Resources, California Code of Regulations, Division 7. California Integrated Waste Management Board (14CCR).

The Mission Bay Landfill is defined under state law as a disposal site and under state regulation as a closed site as indicated below.

State Law: Public Resources Code, Division 30. Waste Management, Part 1. Integrated Waste Management, Chapter 2. Definitions, Section 40122,



**Solid Waste Local Enforcement Agency (LEA) • Development Serv**

1010 Second Avenue, Suite 600, MS 606L • San Diego, CA 92101-4998

Tel (619) 533-3688 Fax (619) 533-3689

EXHIBIT NO. 4  
APPLICATION NO.  
**6-01-129**

City's Response

*"Disposal Site" or "site" includes the place, location, tract of land, area, or premises in use, intended to be used, or which has been used, for the landfill disposal of solid waste. "Disposal site" includes solid waste landfill, as defined in Section 40195.1.*

State Regulation: Title 27 Environmental Protection, California Code of Regulations, Division 2. Solid Waste, Chapter 2. Definitions, Article 2, Specific Definitions, Section 20164,

*"Closed Site" (CIWMB) means a disposal site that has ceased accepting waste and was closed in accordance with applicable statutes, regulations, and local ordinances in effect at the time.*

There were no state laws specifying landfill closure requirements when Mission Bay Landfill closed in 1959.

It is important to note that each regulatory agency has very specific laws, regulations, codes, ordinances and rules. The above references are specific to LEA authority only.


Pursuant to 27CCR Section 21100 the LEA has jurisdiction over new postclosure activities that may jeopardize the integrity of previously closed disposal sites or pose a potential threat to public health and safety or the environment. In addition, in accordance with 27CCR, Section 21190(c) - Postclosure Land Use - All proposed postclosure land uses, other than non-irrigated open space, on closed sites will be submitted to the LEA. The LEA will review and approve proposed postclosure land uses if the project involves structures within 1,000 feet of the disposal area, structures on top of waste, modification of the cap, or irrigation over waste. The purpose for notification of postclosure activities is to ensure that the proposed postclosure land uses are designed and maintained to protect public health and safety and prevent damage to structures, roads, landfill cap, drainage systems, utilities and gas monitoring and control systems.

The LEA offers the following comments specific to questions posed in your three bullets.

Bullet One

1. LEA awareness of the *Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract*.

The LEA requested the referenced study be performed by SeaWorld at a joint agency meeting on June 6, 2001 in response to their proposed projects. SeaWorld complied with this request by submitting an initial *Work Plan for Soil Vapor Assessment - SeaWorld Expansion Plan, 16-Acre Tract* on July 20, 2001. The LEA provided comments on the work plan and a response to LEA comments was



received on October 22, 2001. The *Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract* was received by the LEA on January 7, 2002.

2. Role of the *Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract* document in relation to LEA determinations regarding SeaWorld proposals.

A review of the referenced study resulted in the Community Health and Safety Plan identifying a component for monitoring, in addition to methane, hydrogen sulfide gas. Furthermore, the LEA required three permanent landfill gas monitoring probes be installed and a monitoring program be developed prior to final occupancy of the Journey to Atlantis Ride.

3. How is the LEA implementing the recommendations on Page 4-4 of the *Results of Soil Vapor Assessment SeaWorld Expansion Plan, 16-Acre Tract* requiring conformance with Title 27 regulations?

Any proposed post closure land use project on or within 1,000 feet of a landfill requires compliance with 27CCR. It is a requirement of the project proponent to demonstrate compliance with state regulations. The LEA reviewed the following document, *Final Demonstration of Compliance with Title 27, Section 21190, For The "Journey to Atlantis" Amusement Ride*. This document proposed the following measures in relation to landfill gas compliance:

- Service trench dam to control potential landfill gas migration through SDG&E utility trench.
- Soil compaction required for the Journey to Atlantis (JTA) project will exhibit a lower porosity than the surrounding soil and deflect potential gas migration into the JTA footprint. Landfill gas will follow the path of least resistance.
- Foundation structures are to be constructed of high-compression strength concrete, with waterstop installed at cold joints further deter landfill gas migration.
- Volclay waterproofing panels will be installed beneath the bottom of the concrete foundations and up along the subgrade walls to approximately grade elevation. The Volclay panels consist of kraft board filled with sodium bentonite and have a hydraulic permeability of  $1 \times 10^{-9}$  centimeters per second. Installation of the panels provides a waterproofing system around subgrade structures and provides for further resistance to intrusion of landfill gas migration.
- Continuous methane gas monitoring will be conducted using hardwired methane detectors in buildings.

- Other structures, including electrical pull boxes and storm water transfer pump station, will be monitored with a portable field instrument.
- Buildings with subgrade structures and enclosed portions of the JTA structure will have air exchanges provided by active exhaust fans.
- Installation of three permanent landfill gas probes.
- Implementation of a landfill gas monitoring program.

The LEA found the proposed measures acceptable and approved the proposed postclosure land use project Journey to Atlantis and its Community Health and Safety Plan on April 23, 2003.

1. Presence of Hydrogen Sulfide detected during soil vapor tests.

As previously mentioned any proposed postclosure land use project on or within 1,000 feet a landfill is required to be reviewed and approved by the LEA. Any subsurface work will require a Community Health and Safety Plan that is reviewed and approved by the LEA. A component of the Community Health and Safety Plan will be the monitoring for hydrogen sulfide gas. Presently, concentrations of hydrogen sulfide gas have been detected in the subsurface soils and not on the surface.

Bullet Two

1. Presence of two separate landfills?


The LEA is unaware of any documentation that identifies separate waste disposal locations for municipal waste and hazardous wastes.

The boundaries of the Mission Bay Landfill are approximate. In approving postclosure land uses proposed by Sea World the LEA takes into consideration soils report, locations of groundwater wells, locations of temporary landfill gas probes, results of past projects, presence of differential settlement, etc.

Bullet Three

1. Technical Advisory Committee investigation status and projected timeline.

To obtain an update on the status of the Technical Advisory Committee's current investigation on conditions at the landfill and projected timeline for the investigation please contact Chris Gonaver, Deputy Director for the City of San Diego Environmental Services Department – Environmental Protection Services



Page 5 of 5  
Ms. Ellen Lirley  
August 28, 2003

at (858) 573-1212.

The proposed investigation will include subsurface activity on and within 1,000 feet of the landfill. Prior to implementing the investigation, the City will have to submit an investigation work plan and Community Health and Safety Plan for LEA review and approval. To date, the LEA has not received an investigation work plan or Community Health and Safety Plan.

Should you require any additional information or have questions regarding the above responses, please call me at (619) 533-3694.

Sincerely,



Rebecca Lafreniere, REHS  
Solid Waste Inspector III

cc: Chris Gonaver, City of San Diego ESD (MS# 1103A)



## THE CITY OF SAN DIEGO

RECEIVED

AUG 20 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

August 19, 2003

Ms. Ellen Lirley  
California Coastal Commission  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108

Re: Coastal Development Permit #6-01-129 Revocation Request – Sea World  
Splashdown Ride

Dear Ms. Lirley:


This letter is in response to your letter dated August 13, 2003 requesting information related to the Coastal Development Permit #6-01-129 – Sea World Splashdown Ride (Ride) revocation request. Outlined below are our responses to your specific questions as they relate to the Mission Bay Landfill (Landfill).

The City of San Diego, Environmental Services Department (ESD) is responsible for compliance with all of the requirements of the Local Enforcement Agency (LEA) and the Regional Water Quality Control Board (Regional Board) as an owner and historic operator of the Landfill.

1. On January 4, 2002, the ESD received a copy of *Results of Soil Vapor Assessment Sea World Expansion Plan – January 2002* (Vapor Study). This Vapor Study was prepared by Sea World as required by the LEA and has been available for public review since it was released.

At the March 21, 2003 Mission Bay Technical Advisory Committee (TAC) monthly meeting, the LEA presented a summary of this Vapor Study, to all in attendance including members of the California Earth Corps. The probe location map with corresponding analytical results was presented. Additionally, the results of this Vapor Study, and its significance, were discussed at several of our subsequent monthly meetings.

The Vapor Study included the installation of 28 soil vapor probes. The referenced test well, J-24, located closest to the known limits of the Landfill, did measure 1820 parts per million (ppm) of hydrogen sulfide gas ( $H_2S$ ). However, this sample was taken 15 feet below ground surface and 315 feet from the project site. No elevated levels of  $H_2S$  were found on the surface at any of the sample locations.





Page 2 of 3

Ms. Ellen Lirley

August 19, 2003

Exhibit "D" in the revocation request is a letter from Soil Water Air Protection Enterprise dated July 21, 2003. This letter mentions the finding of elevated levels of H<sub>2</sub>S and methane, however it does not clarify that these concentrations were found below ground surface. There were no elevated levels found at the surface, consequently, there was no exposure to the workers or to the public.

The letter also references OSHA/NIOSH permissible exposure limit (PEL) for H<sub>2</sub>S at 10 ppm and the concentration considered immediately dangerous to life and health (IDLH) as 100 ppm. For clarification, the PEL, as defined by OSHA, is the maximum 8-hour time-weighted average of any airborne contaminant and represents conditions to which nearly all workers may be repeatedly exposed day after day without adverse effect. The IDLH, as defined by NIOSH, represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

The LEA and the Regional Board are the regulatory agencies overseeing the Landfill and surrounding development. They have both been very involved in the review of plans and reports to ensure the health and safety of the public and the environment. The LEA, in a letter dated April 25, 2003, approved the construction of the Ride. The ESD has no direct responsibility over the project site other than ensuring that Sea World is coordinating with the appropriate regulatory agencies.

The ESD is in full compliance with Title 27 regulations as regulated by the LEA. ESD performs annual landfill gas surface monitoring. With respect to the recommendations contained in the Vapor Study, the ESD has recently hired SCS Engineers to perform an assessment of the Landfill. Soil gas testing will be incorporated into this assessment.

2. The City of San Diego records identify only one site for the Landfill. These records indicate that the Landfill accepted both municipal and industrial waste and commingled these waste during disposal. The revocation request states "an industrial Class I hazardous waste dump had been operating in and around the location of the Ride and that the exact boundaries of the toxic-hazardous waste dump were unknown". The Landfill was not operated or permitted as a Class I hazardous waste site, though records indicate that industrial waste was disposed of at the Landfill site.

While the exact limits of the Landfill have not been defined, numerous soil borings have been made in around the Landfill, providing a basis for some understanding of the limits of trash. As part of the geotechnical investigation for the Ride, prepared by Christian Wheeler Engineering, eight soil borings were within the project site and no trash was encountered.

Page 3 of 3

Ms. Ellen Lirley

August 19, 2003

In response to a request made to reclassify the Landfill as a Class I waste management unit, the Regional Board issued a letter dated August 4, 2003. A copy of this letter is attached for your reference.

3. The Mission Bay Technical Advisory Committee (TAC) was formed to address the issue of potential threats from the Landfill to the public and the environment by overseeing the development and implementation of a new site assessment for the Landfill. The first meeting was held on August 16, 2002. As previously mentioned, the ESD has entered into a consultant contract with SCS Engineers to reevaluate the existing monitoring program and perform a full assessment to determine if the landfill poses a threat to the public or the environment. The scope of their work includes; 1) review of all previous investigations performed on the site 2) develop a Site Assessment Plan (SAP) identifying potential chemicals of concern and appropriate screening criteria 3) implement the approved SAP and 4) prepare a Final Site Assessment Report including recommendations if warranted. It is anticipated that a Draft SAP will be presented to the TAC in November 2003 for their input and comment. Implementation of the approved SAP will begin in 2004 with a Final Report expected in July 2004.
4. Since 1985, the ESD has performed quarterly surface and groundwater monitoring as required by the Regional Board. Annual landfill gas monitoring is also performed. Additionally, the LEA and Regional Board perform regular inspections at the site. There has been no evidence that significant amounts of chemicals are leaking or migrating from the site. The City continues to perform maintenance on the Landfill site to ensure that proper drainage and cover are maintained which are in compliance with all regulatory requirements.

If you have any questions or would like further clarification, please contact me at (858) 573-1212.

Sincerely,



Chris Gonaver  
Environmental Protection Division, Deputy Director

Enclosure

CG/smc

cc: Rebecca Lafreniere, City of San Diego Local Enforcement Agency  
John Odermatt, San Diego Regional Water Quality Control Board





## Department of Toxic Substances Control



Winston H. Hickox  
Agency Secretary  
California Environmental  
Protection Agency

Edwin F. Lowry, Director  
1001 "I" Street, 25<sup>th</sup> Floor  
P.O. Box 806  
Sacramento, California 95812-0806

Gray Davis  
Governor

September 5, 2003

RECEIVED

SEP 09 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Ms. Ellen Lirley  
Coastal Planner  
California Coastal Commission  
7275 Metropolitan Drive, Suite 103  
San Diego, California 92108-4402

Dear Ms. Lirley

Thank you for your letter dated August 20, 2003, to Mr. Edwin Lowry, Director of the Department of Toxic Substances Control (DTSC), which relates to a revocation request filed with the California Coastal Commission by California Earth Corps. At the request of Director Lowry, I have been asked to respond to your concerns. In your letter, you requested that DTSC summarize its jurisdiction in relation to the former Mission Bay Landfill (Landfill), located near Sea World in the City of San Diego (City). In addition, you asked that we notify you of any actions that we undertake in this matter.

According to our records, DTSC has not had any formal regulatory involvement with the Landfill. The records, contained in the database entitled "Site Mitigation and Brownfields Database", indicate that the landfill operated from 1952 to 1959 as a municipal landfill. The records also indicate that DTSC, and other regulatory agencies investigated the site for toxic and hazardous waste disposal in the early 1980s. DTSC's review was conducted primarily through a records search as opposed to field investigations. On or about January 20, 1987, DTSC (formerly known as the Department of Health Services, Toxic Substances Control Division) entered into an agreement with the City, giving responsibility over the Landfill to the City. The final entry in DTSC's database is dated April 10, 1995, and indicates "No Further Action for DTSC."

DTSC received a letter dated May 15, 2003, from Mr. John E. Wilks, III and Mr. Scott Andrews of the Sierra Club, alleging the presence of dangerous levels of hydrogen sulfide and explosive concentrations of methane in the air near the site of a proposed ride at Sea World. They also claimed that contaminated soils were excavated

Ms. Ellen Lirley  
September 5, 2003  
Page 2

from the former landfill and sent for disposal in a municipal landfill without proper testing for hazardous constituents. DTSC is in the process of investigating these concerns, but preliminary indications are that these will not be a problem requiring DTSC intervention. We will share our final results when they become available.

DTSC does not anticipate any further action, pending resolution of the two issues raised by the Sierra Club. It appears that steps being taken by the City, the Local Enforcement Agency, and the Regional Water Quality Control Board are appropriate and provide an adequate level of regulatory oversight.

Thank you again for writing. Should you have any questions or need further assistance, please feel free to contact me at (916) 322-0349 or Ms. Nennet V. Alvarez, Chief of the Statewide Compliance Division-Cypress Branch, Hazardous Waste Management Program, at (714) 484-5350.

Sincerely



---

Watson Gin, P.E.  
Deputy Director  
Hazardous Waste Management Program

cc: Mr. Scott Andrews  
San Diego Chapter  
Sierra Club  
3820 Ray Street  
San Diego, California 92104

Mr. John E. Wilks, III  
San Diego Chapter  
Sierra Club  
3820 Ray Street  
San Diego, California 92104

Ms. Ellen Lirley  
September 5, 2003  
Page 3

cc: Mr. Matt Trainor  
Operations Supervisor  
Hazardous Materials Division  
Department of Environmental Health  
County of San Diego  
P.O. Box 129361  
San Diego, California 92123

Mr. Steve Fontana  
Deputy Director  
Refuse Disposal Division, Environmental Services  
City of San Diego  
9601 Ridgehaven Court, Suite 310, MS #1103A  
San Diego, California 92101

Mr. Chris Gonaver  
Deputy Director  
Environmental Protection, Environmental Services  
City of San Diego  
9601 Ridgehaven Court, Suite 310, MS #1103A  
San Diego, California 92123-1636

---

Ms. Rebecca Lafreniere  
Solid Waste Inspector III  
Solid Waste Local Enforcement Agency  
City of San Diego  
1010 Second Avenue, Suite 600, MS #606L  
San Diego, California 92101-4998

Mr. John H. Robertus  
Executive Officer  
San Diego Regional Water Quality Control Board  
9174 Sky Park Court, Suite 100  
San Diego, California 92123

Ms. Ellen Lirley  
September 5, 2003  
Page 4

cc: Mr. John Odermatt, M. Sc., RG  
Senior Geologist  
Land Discharge Unit  
San Diego Regional Water Quality Control Board  
9174 Sky Park Court, Suite 100  
San Diego, California 92123

Mr. Edwin F. Lowry, Director  
Department of Toxic Substances Control  
1001 "I" Street, 25<sup>th</sup> Floor  
P.O. Box 806  
Sacramento, California 95812-0806

Mr. Kim Wilhelm, Chief  
Statewide Compliance Division  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, California 95826

---

~~Ms. Nanner V. Alvarez, Chief~~  
Cypress Branch  
Statewide Compliance Division  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, California 90630

Mr. Juan M. Jimenez, Chief  
Border Unit  
Cypress Branch  
Statewide Compliance Division  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
2878 Camino Del Rio South, Suite 402  
San Diego, California 92108



# Thur 10a

## Department of Toxic Substances Control



Winston H. Hickox  
Agency Secretary  
California Environmental  
Protection Agency

Edwin F. Lowry, Director  
1001 "I" Street, 25<sup>th</sup> Floor  
P.O. Box 806  
Sacramento, California 95812-0806

Gray Davis  
Governor

August 14, 2003

**RECEIVED**  
AUG 25 2003  
CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Ms. Rebecca Lafreniere  
Solid Waste Inspector III  
Solid Waste Local Enforcement Agency  
City of San Diego  
1010 Second Avenue, Suite 600, MS #606L  
San Diego, California 92101-4998

Dear Ms. Lafreniere:

Thank you for your July 9, 2003, letter clarifying the distinction between the City of San Diego Solid Waste Local Enforcement Agency (LEA) and the City of San Diego Environmental Services Department (ESD). Your letter was in response to the Department of Toxic Substances Control's (DTSC) letter to Mr. John Wilks III and Mr. Scott Andrews of the Sierra Club, San Diego Chapter dated June 23, 2003. This information will facilitate future communication between DTSC and the appropriate responsible agencies within the City of San Diego concerning the Mission Bay Landfill.

In a telephone conversation on July 23, 2003, between Ms. Ellen Lirley, Coastal Program Analyst, California Coastal Commission and my staff, Ms. Lirley reiterated that the principal reason for the permit denial, was because of an ongoing field investigation at Sea World. DTSC erred in stating that LEA was conducting the field investigation. The field investigation is being conducted under the oversight of ESD. As stated in your letter, ESD will manage a contract with SCS Engineers to perform a site assessment of the closed Mission Bay Landfill.

In our continuing efforts to investigate the complaint allegations, DTSC conducted a site visit on July 29, 2003. The construction site was observed, records were reviewed and obtained, and interviews were taken from various Sea World representatives. The information is being reviewed in relation to the allegations in the complaint. A draft report of our findings is currently being prepared. We will keep you apprised of further actions DTSC takes in response to this complaint.

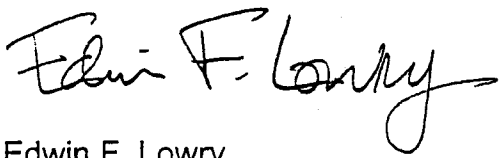
**AGENCY LETTERS  
OF COMMENT**

*The energy challenge facing California is real. Every Californian needs to take it  
For a list of simple ways you can reduce demand and cut your energy co.*

Ms. Rebecca Lafreniere  
August 14, 2003  
Page 2

Thank you again for writing. Should you have any questions or need further assistance, please feel free to contact me or Ms. Nennet V. Alvarez, Chief of the Statewide Compliance Division-Southern California Branch, Hazardous Waste Management Program, at (714) 484-5350.

Sincerely,



Edwin F. Lowry  
Director

cc: Councilmember Donna Frye  
City Council District 6  
City of San Diego  
202 "C" Street, MS # 10A  
San Diego, California 92101

Mr. Scott Andrews  
San Diego Chapter  
Sierra Club  
3820 Ray Street  
San Diego, California 92104

Mr. John E. Wilks, III  
San Diego Chapter  
Sierra Club  
3820 Ray Street  
San Diego, California 92104

Mr. Steve Fontana  
Deputy Director  
Refuse Disposal Division, Environmental Services  
City of San Diego  
9601 Ridgehaven Court, Suite 310, MS #1103A  
San Diego, California 92101



Ms. Rebecca Lafreniere  
August 14, 2003  
Page 3

cc: Mr. Chris Gonaver  
Deputy Director  
Local Enforcement Agency  
Environmental Protection, Environmental Services  
City of San Diego  
9601 Ridgehaven Court, Suite 310, MS #1103A  
San Diego, California 92123-1636

Mr. Matt Trainor  
Operations Supervisor  
Hazardous Materials Division  
Department of Environmental Health  
County of San Diego  
P.O. Box 129361  
San Diego, California 92123

Ms. Ellen Lirley  
Costal Program Analyst  
San Diego Coast District Office  
California Coastal Commission  
7575 Metropolitan Drive, Suite 103  
San Diego, California 92108-4402

Mr. Winston H. Hickox  
Agency Secretary  
California Environmental Protection Agency  
1001 "I" Street, 25<sup>th</sup> Floor  
Sacramento, California 95814

Mr. John H. Robertus  
Executive Officer  
San Diego Regional Water Quality Control Board  
9174 Sky Park Court, Suite 100  
San Diego, California 92123


Ms. Rebecca Lafreniere  
August 14, 2003  
Page 4

cc: Mr. John Odermatt, M. Sc., RG  
Senior Geologist  
San Diego Regional Water Quality Control Board  
Land Discharge Unit  
9174 Sky Park Court, Suite 100  
San Diego, California 92123

Mr. Watson Gin, P.E.  
Deputy Director  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
1001 "I" Street, 11<sup>th</sup> Floor  
P.O. Box 806  
Sacramento, California 95812-0806

Mr. Kim Wilhelm, Chief  
Statewide Compliance Division  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, California 95826

Ms. Nennet V. Alvarez, Chief  
Southern California Branch  
Statewide Compliance Division  
Hazardous Waste Management Program  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, California 90630





Winston H. Hickox  
Agency Secretary  
California Environmental  
Protection Agency

## Department of Toxic Substances Control

Edwin F. Lowry, Director  
400 P Street, 4th Floor, P.O. Box 806  
Sacramento, California 95812-0806



Gray Davis  
Governor

*FILE COPY*

July 24, 2000

Mr. James P. Miller, Jr.  
Mission Bay Park Toxic Cleanup  
P.O. Box 60026  
San Diego, California 92116

*TIM-  
HERE'S THE  
DTSC LETTER  
Bdf 7.28*

Dear Mr. Miller:

Thank you for your recent letter to Governor Davis and your the letter to us requesting that the Department of Toxic Substances Control (DTSC) assume the lead agency role for remediation of the Mission Bay Landfill (Site). You asked for this action on behalf of the citizen group, the Mission Bay Park Toxic Cleanup (MBPTC).

DTSC has carefully reviewed your letter and contacted other regulatory agencies involved with this site. Our research, which is described in detail below, indicates that the site is in compliance with the involved regulatory agencies' requirements. However, in order to ensure all parties have a clear understanding of future steps at the site, DTSC offers to coordinate a meeting with all pertinent regulatory agencies and MBPTC to address your concerns. The following are DTSC's findings which may prove useful to an overall understanding of agencies' roles for the landfill:

1. On November 1, 1984, DTSC (formerly the Department of Health Services) entered into an agreement with the City of San Diego (City), which places full responsibility on the City for any development of the Mission Bay Landfill site. The City also assured in the agreement that, if the City decides to proceed with the hotel project, the City will take all appropriate measures to protect public health and safety both during the construction of the project and after it is constructed. This agreement was signed when the City was considering developing part of the Mission Bay Landfill for a hotel complex. Later, DTSC conducted a Preliminary Assessment (PA) and determined that the site did not pose a significant threat. The PA also indicated that the County monitors the City's actions and that the City was the lead agency.
2. The United States Environmental Protection Agency (U.S. EPA) conducted several environmental assessments and finally completed a Hazard Ranking Score (HRS). The HRS score of 14.1 assigned was not high enough for the site

Mr. James Miller, Jr.


July 24, 2000

Page 2

to be listed on the National Priority List (NPL). Therefore, U.S. EPA recommended the status of No Further Remedial Action Planned and placed it in an archive status on this listing. According to Ms. Rachel Loftin of U.S. EPA, MBPTC recently requested U.S. EPA to reevaluate the HRS score and include the site on the NPL. In response to this request, U.S. EPA advised MBPTC to present information regarding the site's change of condition and additional data warranting HRS revision.

3. In a telephone conference with Mr. Mark Alpert of the San Diego Regional Water Quality Control Board (RWQCB), Mr. Alpert stated that in 1983, 16 groundwater monitoring wells were installed within the boundaries of the former landfill and four wells were installed off-site under the supervision of the RWQCB. Subsequently, on September 16, 1985, RWQCB Order No. 85-78, "Waste Discharge Requirement for the Site Closure of the City of San Diego Mission Bay Landfill" was adopted. Currently, the Mission Bay Landfill is regulated under the RWQCB Order No. 97-11, "General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills." Mr. Alpert also informed DTSC that the RWQCB and the City of San Diego, the Local Enforcement Agency (LEA), have a joint lead at the site.
4. In a telephone conference with Ms. Rebecca Lafreniere of the City of San Diego Solid Waste (CSDSW), she stated that CSDSW became the Certified LEA in November 1997 for the City of San Diego area. The County of San Diego is no longer monitoring CSDSW's actions. CSDSW is currently monitoring the site quarterly and found no outstanding violations. CSDSW is the lead agency for the maintenance of the site and RWQCB is the lead agency for the water quality issues. The owner of the property is the City of San Diego Environmental Services Department.
5. The California Integrated Waste Management Board (IWMB) also had some involvement at the site in the past according to Mr. Gino Yekta of IWMB. Mr. Yekta indicated that as long as the owner/operator is in compliance with Section 21190 of the California Code of Regulation, they have the right to develop the site. Approval from IWMB and LEA are required prior to any further development of the site. IWMB has not yet received a request for such an approval.

In summary, the site is in compliance with the CSDSW, RWQCB, and IWMB requirements. Since the City of San Diego and the RWQCB actively regulate the site, other regulatory agencies' involvement may not be necessary. However, as stated



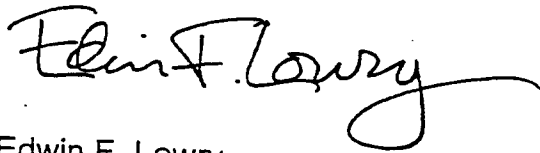
Mr. James Miller, Jr.

July 24, 2000  
Page 3

earlier, in order to ensure all parties have a clear understanding of the future steps which may be taken, DTSC offers to convene a meeting with all pertinent regulatory agencies and MBPTC to address the concerns you raise.

Please contact Ms. Nennet Alvarez, Chief of the Southern California Cleanup Operations Branch B at (714) 484-5459, if you would like to have DTSC arrange this meeting.

Very truly yours,



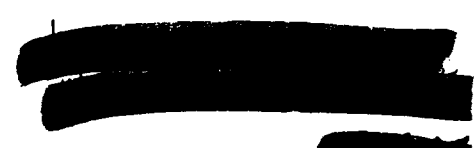
Edwin F. Lowry  
Director

cc: Mr. Robert Ferrier  
Environmental Services Department  
City of San Diego  
9601 Ridgehaven Court, MS 1103A  
San Diego, California 92124

Ms. Rebecca Lafreniere  
Solid Waste Local Enforcement Agency  
City of San Diego  
1222 First Avenue, MS 501  
San Diego, California 92101-4155

Mr. Matt Trainor  
Department of Environmental Health  
County of San Diego  
1255 Imperial Avenue, Suite 4  
San Diego, California 92101

Mr. Mark Alpert  
Department of Environmental Health  
County of San Diego  
1255 Imperial Avenue, Suite 4  
San Diego, California 92101





# California Regional Water Quality Control Board

## San Diego Region



**Terry Tamminen**  
Secretary for  
Environmental  
Protection

9174 Sky Park Court, Suite 100, San Diego, California 92123-4340  
(858) 467-2952 • Fax (858) 571-6972  
<http://www.swrcb.ca.gov/rwqcb9>

**Arnold Schwarzenegger**  
Governor

RECEIVED

JAN 14 2004

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

January 9, 2004

Mr. Michael Reilly, Chairman  
C/o California Coastal Commission  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4402

In reply refer to:  
**LDU:06-0378.02:mcdab**

Dear Mr. Reilly:

**SUBJECT: COASTAL DEVELOPMENT PERMIT #6-01-129 REVOCATION  
REQUEST - SEA WORLD SPLASHDOWN RIDE**

This letter acknowledges our receipt of a letter from the Honorable Dick Murphy, Mayor of San Diego, requesting that the Regional Water Quality Control Board - San Diego Region ("RWQCB") provide public testimony on your agenda item for Coastal Development Permit No. 6-01-129. The Regional Board Chairman, Mr. John Minan, has directed that I respond to this request from Mayor Murphy by corresponding directly to you on this matter. As indicated below, the RWQCB staff has previously provided the California Coastal Commission staff with detailed written information regarding the Mission Bay Landfill. As a result, I will respectfully decline the invitation of Mayor Dick Murphy to testify during the upcoming Coastal Commission hearing on this topic.

On August 13, 2003, the RWQCB received a letter via fax from your staff requesting information concerning the Mission Bay Landfill and the status of further work being done at the request of the Mission Bay Landfill Technical Advisory Committee (TAC). That letter requested written responses be provided to the Coastal Commission staff by August 19, 2003. The RWQCB staff completed written responses to the questions regarding the Mission Bay Landfill and returned those responses to your staff within the requested timeframe.

As stated in our previous letter provided to your staff, the RWQCB regulates the Mission Bay Landfill through waste discharge requirements (WDRs) issued to the City of San Diego under Order 97-11 (copy was attached to our letter dated August 19, 2003 - previously provided to your staff). Order 97-11 prescribes requirements for regular maintenance, monitoring, and reporting for inactive landfills in the San Diego Region. Historically, the City has provided the RWQCB with technical reports of investigation results, analytical results for groundwater, and analytical results from surface water and sediment sampling in Mission Bay. The City continues to provide semi-annual monitoring reports to the RWQCB and they have performed landfill

*California Environmental Protection Agency*

Mr. Michael Reilly, Coastal Commission  
Coastal Commission Permit No.  
6-01-129: Sea World

-2-

January 9, 2004

maintenance in compliance with Order 97-11. We anticipate the City will continue to do so in the future.

The City has reported that low concentrations of organic "waste constituents" are being detected in groundwater monitoring wells associated with the Mission Bay Landfill. The detected concentrations of various constituents experience annual fluctuation in some of the groundwater monitoring wells associated with this site. It is difficult to confidently ascribe meaningful trends to the data due (in part) to the low concentrations observed in the wells. Concentrations of various organic and inorganic constituents have also been detected in surface waters and sediments in Mission Bay. However, the presence of other potential natural and urban sources of inorganic and/or organic constituents makes it difficult to determine if the detected constituents in surface waters or sediments were specifically derived from the Mission Bay Landfill. At this point in time, we are not aware of any information that would cause the RWQCB to require a change to the current monitoring requirements for the Mission Bay Landfill.

The RWQCB is aware that members of the public, Messers. Wilks and Andrews representing the Sierra Club -San Diego Chapter, California Earth Corps, and Mission Bay Park Toxics Cleanup Group; believe that wastes were historically discharged within the so-called "South Shores area." During October and November 2003, those representatives provided the RWQCB with xerox copies of aerial photographs in support of their allegations. To my knowledge, the RWQCB does not have any independent records of the alleged activities or independent physical evidence to evaluate the accuracy of the assertions made by Messers. Wilks and Andrews. In 2003, the City of San Diego contracted a consultant to conduct a study of the Mission Bay Landfill and the RWQCB looks forward to reviewing the results from the investigation being done at the request of the Mission Bay Technical Advisory Committee. At this time, we anticipate the final results from that study will be available during July 2004. Those results will be part of the information used to assess the need for any further regulatory action by the RWQCB.

In conclusion, it is important to further clarify that it is not appropriate for the RWQCB to specifically comment on the proposed SeaWorld splashdown ride. It is not the role of this Board to assess whether the project does or does not represent a public health threat.

The heading portion of this letter includes a Regional Board code number noted after "In reply refer to:" In order to assist us in the processing of your correspondence please include this code number in the heading or subject line portion of all correspondence and reports to the Regional Board pertaining to this matter.

Should your staff have any questions concerning the above matter, please contact Mr. Brian McDaniel at (858) 627-3972 or by email at [mcdab@rb9.swrcb.ca.gov](mailto:mcdab@rb9.swrcb.ca.gov).

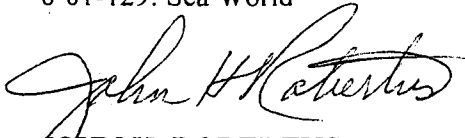
Respectfully,

*California Environmental Protection Agency*

Mr. Michael Reilly, Coastal Commission  
Coastal Commission Permit No.  
6-01-129: Sea World

-3-

January 9, 2004



JOHN H. ROBERTUS  
Executive Officer

cc: Honorable Mayor Dick Murphy, City Administration Building, 202 C Street, San Diego, CA 92101  
Honorable Ms. Donna Frye, Office of the Council Representative for District 6, 202 C Street, 10<sup>th</sup>  
Floor, San Diego, CA 92101, Attn: Ms. Nicole Capretz (for distribution to all Mission Bay TAC  
members).





# California Regional Water Quality Control Board

## San Diego Region

Winston H. Hickox  
Secretary for  
Environmental  
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb9>  
9174 Sky Park Court, Suite 100, San Diego, California 92123-4340  
Phone (858) 467-2952 • FAX (858) 571-6972



RECEIVED

August 18, 2003

AUG 20 2003

Ms. Ellen Lirley, Coastal Planner  
California Coastal Commission  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4402

In reply refer to:

LDU:06-0378.02:mcdab

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Dear Ms. Lirley:

**SUBJECT: COASTAL DEVELOPMENT PERMIT #6-01-129 REVOCATION  
REQUEST - SEA WORLD SPLASHDOWN RIDE**

This letter acknowledges our receipt of your letter via fax (dated August 13, 2003) requesting information concerning the Mission Bay Landfill and the status of further work being done at the request of the Mission Bay Landfill Technical Advisory Committee (TAC). Your letter references a technical report from 2002 entitled "*Results of Soil Vapor Assessment Sea World Expansion Plan, 16-Acre Tract*" prepared by the IT Corporation.

Your letter requested a response by August 19, 2003. The questions included in your letter are indicated below in italicized font with our response is indicated after each question.

- Please identify when you (the Regional Water Quality Control Board [RWQCB]) were first aware of the existence of the referenced study and what role it has played in any determination regarding Sea World proposals from that time forward. Please advise how your agency is implementing the recommendations on Page 4-4 of the Soil Vapor Report requiring conformance with Title 27 regulations; or, if not your agency, what agency is responsible for such implementation. Also, please identify what investigations you intend to pursue regarding the high levels of hydrogen sulfide detected during the soil vapor tests.*

**RWQCB staff Response:** The RWQCB received the cited report on January 7, 2002.

In general, the RWQCB provides regulatory oversight of discharger compliance with water quality requirements, those derived from the State Water Resources Control Board - SWRCB, included in California Code of Regulations (CCR), Title 27. The primary concerns of the RWQCB are related to any activity that may adversely affect the containment of the "wastes" - including solid wastes, waste constituents, and/or degradation products thereof - by the Mission Bay Landfill. Such activities must not adversely impact the containment of "wastes" by the landfill, contribute to (or directly create) conditions of pollution or nuisance, result in a violation of any State Water Quality Control Plans, or result in violations of the statutory requirements of the California Water Code.

**California Environmental Protection Agency**

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at <http://www.swrcb.ca.gov>.

August 18, 2003

The Local Enforcement Agencies (LEAs) oversee discharger compliance with Title 27 requirements derived from the CIWMB. The work of the LEAs generally include oversight of requirements relating to the protection of public health, including monitoring and control of landfill gases. It appears that the recommended practices, developed by the IT Corporation and listed on page 4-4 of the Report, were primarily developed to control potential impacts to public health from exposures to emissions and accumulations of landfill gas. The recommended mitigation measures would probably best be evaluated in conjunction with the regulatory requirements normally overseen by the City LEA.

The RWQCB encourages you to contact the City LEA to obtain their assessment of the conclusions and recommendations from the "Soil Vapor Report" referenced in your letter. The point of contact for the LEA is Ms. Rebecca Lafreniere, City of San Diego Local Enforcement Agency, 1010 Second Avenue, Suite 600 (MS 606L), San Diego, CA 92101-4998, TEL: 619-533-3694. The City LEA also participates in the Mission Bay TAC.

2. *The opponents identify two separate types of waste materials at, or near, the Sea World leasehold and splashdown ride site – a municipal landfill and a hazardous toxic waste dump. Please clarify whether these are distinct in location or intermingled, and their location in relation to the Mission Bay Landfill boundaries as shown in the 2002 study. Please also indicate the source of your conclusions.*

**RWQCB staff Response:** The information available for the RWQCB suggests that the Mission Bay Landfill operated between the years 1952 to 1959. Operational requirements and standards of practice for landfills existing in the 1950's were not necessarily the same as the waste classification and disposal practices that apply to currently operating solid waste disposal units. It is very likely that the landfill received a mixture of municipal, industrial, and commercial waste streams. It is not clear that there was any attempt to segregate wastes by source/type during waste disposal operations at the Mission Bay Landfill. As a result, the RWQCB concludes that various types of wastes are likely to be commingled within the waste management unit.

During the 1950's, industries diverted discharges of liquid industrial wastes away from the developing sewer conveyance and treatment system. As a result, dischargers of industrial liquid wastes were actively seeking alternative methods to dispose of their various waste streams. It appears that existing landfills offered one alternative method for various dischargers to dispose of their liquid industrial waste streams. The RWQCB files contain historical information (correspondence) indicating that at least one component of the waste stream discharged at the Mission Bay Landfill included various liquid wastes (including drums containing spent acids and solvent waste) from industrial operations at the former Convair Plant located in the City of San Diego. The RWQCB recently received requests from the Sierra Club- San Diego Chapter to "re-classify" the Mission Bay Landfill as a Class I waste management unit. Attached to this letter is our written response (dated August 4, 2003) to that request.

Ms. Ellen Lirley, Coastal Commission  
Coastal Development Permit  
#6-01-129 Revocation Request –  
Sea World Splashdown Ride

- 3 -

August 18, 2003

There is a significant level of uncertainty regarding the exact boundaries of the past waste disposal operations at the Mission Bay Landfill. One of the objectives of the study requested by the Mission Bay Landfill TAC is to more exactly identify the boundary of the waste management unit.

3. *Please provide an update on the status of the Technical Advisory Committee's current investigations at the landfill, and advise the projected timeline for this investigation.*

**RWQCB staff Response:** The RWQCB was invited by Councilwoman Donna Frye's office to participate in the Mission Bay TAC. For an update on the status of the Mission Bay TAC, it is more appropriate that you contact the City representatives who regularly convene that group. I suggest you contact either of the following people:

Ms. Nicole Capretz, c/o Council Representative District 6, 202 "C" Street, 10<sup>th</sup> Floor, San Diego, CA 92101, via telephone at (619) 236-6616 or via email at [ncapretz@sanidiego.gov](mailto:ncapretz@sanidiego.gov).

Mr. Chris Gonaver, City of San Diego – Environmental Services Department, 9610 Ridgehaven Court, Suite 310, San Diego, CA 92123, via telephone at (858) 573-1212 or via email at [cgonaver@sanidiego.gov](mailto:cgonaver@sanidiego.gov).

4. *Please also provide a status report on the landfill, describing the current status and monitoring efforts, identifying any trends in data. In addition, please advise if any new information has come to your attention that changes your previous assessment and monitoring strategy.*

**RWQCB staff Response:** The City of San Diego (the City) is the "discharger" identified as being responsible for monitoring and maintenance at the Mission Bay Landfill. The RWQCB regulates the Mission Bay Landfill through waste discharge requirements (WDRs) issued to the City under Order 97-11 (attached to this letter). Order 97-11 prescribes requirements for regular maintenance, monitoring, and reporting for inactive landfills in the San Diego Region. Historically, the City has provided the RWQCB with technical reports of investigation results, analytical results for groundwater, and analytical results from surface water and sediment sampling in Mission Bay. The City is providing semi-annual monitoring reports to the RWQCB and the have performed landfill maintenance in compliance with Order 97-11. We anticipate the City will continue to do so in the future.

The City has reported that low concentrations of organic "waste constituents" being detected in groundwater monitoring wells associated with the Mission Bay Landfill. The detected concentrations of various constituents experience annual fluctuation in some of the wells associated with this site. It is difficult to confidently ascribe meaningful trends to the data due (in part) to the low concentrations observed in the wells. Concentrations of various organic and

Ms. Ellen Lirley, Coastal Commission  
Coastal Development Permit  
#6-01-129 Revocation Request –  
Sea World Splashdown Ride

- 4 -

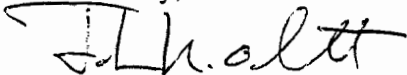
August 18, 2003

inorganic constituents have also been detected in surface waters and sediments in Mission Bay. However, the presence of other potential natural and anthropogenic sources of inorganic and/or organic constituents makes it difficult to determine if the detected constituents in surface waters or sediments were specifically derived from the Mission Bay Landfill. At this point in time, we are not aware of any information that would cause the RWQCB to require a change to the monitoring strategy for the Mission Bay Landfill. However, the RWQCB does look forward to reviewing the results from the investigation being done at the request of the Mission Bay TAC.

There is a large volume of information available in our office files, including a number of technical reports available for the Mission Bay Landfill. You or your staff are encouraged to review that information by scheduling a file review through our Records Officer (Ms. Sylvia Wellnitz TEL: 858-467-2952). The Files available for the Mission Bay Landfill include the following: File Nos. 06-0378.01 (Technical File), 06-0378.02 (Correspondence File), 06-0378.03 (Report File).

We also noted that our mailing address as listed on your letter was incorrect. For future reference, please use the address indicated on the letterhead of this letter. We hope that this information provided in this letter will help to address your concerns about the Mission Bay Landfill. If you have any questions regarding this letter, please contact Mr. Brian McDaniel (TEL: 858-627-3927 or via email at [mcdab@rb9.swrcb.ca.gov](mailto:mcdab@rb9.swrcb.ca.gov)).

Sincerely,



JOHN R. ODERMATT

Senior Engineering Geologist, Land Discharge Unit

JRO:bkmm

Enclosures: Letter response to request from Sierra Club- San Diego Chapter  
Order 97-11 addenda and Monitoring Requirements

cc: Ms. Nicole Capretz, Office of the Council Representative for District 6, 202 C Street, 10<sup>th</sup> Floor, San Diego, CA 92101 (for distribution to all Mission Bay TAC members) w/o Attachments

Mr. Chris Gonaver City of San Diego, Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123 (for distribution to all Mission Bay TAC members) w/o Attachments

Ms. Rebecca Lafreniere, City of San Diego Local Enforcement Agency, 1010 Second Avenue, Suite 600 (MS 606L), San Diego, CA 92101-4998 w/o Attachments



# California Regional Water Quality Control Board

## San Diego Region

Winston H. Hickox  
Secretary for  
Environmental  
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb9>  
9174 Sky Park Court, Suite 100, San Diego, California 92123-4340  
Phone (858) 467-2952 • FAX (858) 571-6972



Gray Davis  
Governor

JW

August 4, 2003

Mr. John E. Wilks, III  
Executive Board Member  
Sierra Club, San Diego Chapter  
3820 Ray Street  
San Diego, CA 92104-3623

In reply refer to:  
LDU:06-0378.02:mcdab

Dear Mr. Wilks:

### SUBJECT: RECLASSIFICATION OF MISSION BAY LANDFILL

The purpose of this letter acknowledges our receipt of your letters (dated June 24, 2003 and July 9, 2003). This letter is also intended to provide a response to your requests that the San Diego Regional Water Quality Control Board ("Regional Board") reclassify the Mission Bay Landfill as a Class I waste management unit.

As you may be aware, the Regional Board classifies the Mission Bay Landfill as a Class III municipal solid waste (MSW) landfill. According to information available to the Regional Board:

- The Regional Board available records do not contain detailed information on the pre-disposal construction (if any) that may have taken place prior to the beginning of waste discharges (*circa* 1952) at the Mission Bay Landfill.
- The Mission Bay Landfill was likely operated as an MSW landfill, under the prevailing conditions in effect during the time period from 1952 to 1959.
- There is evidence to suggest that the Mission Bay Landfill received wastes that could/would be classified as hazardous materials/wastes (*i.e.* barrels of solvents, liquid acidic wastes, *etc.*) by current regulatory standards.

The current regulations, developed by the State Water Resources Control Board (SWRCB), do not classify waste management units (including landfills) based upon the nature of the waste that they received during their operational history. Waste Management Units are classified by a combination of the siting criteria and containment system criteria they can meet at the time of permitting for waste management/disposal operations.

### California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at <http://www.swrcb.ca.gov>.

Recycled Paper



August 4, 2003

To be reclassified as a Class I waste management unit; the Mission Bay Landfill would have to meet the applicable siting and lining requirements in California Code of Regulations (CCR), Title 23 ("Chapter 15 – discharges of hazardous waste to land") and current CCR Title 22 (e.g., double-composite) liner standards. The SWRCB's classification method, as promulgated in 1984 under Subchapter 15, is based upon siting criteria and containment system criteria that a Class I Unit must meet.

State regulations referenced in CCR Title 23 and Title 27 may be accessed on-line at:

<http://www.calregs.com/>

The intent of the SWRCB, regarding application of current regulations to older Units, is expressed in CCR Title 23, Section 2510(g) and CCR Title 27, Section 20080(g). These regulations specifically exempt facilities that were closed, abandoned or inactive (CAI), prior to 1984, from meeting any but the new monitoring requirements. In addition, the decision on whether to apply the revised monitoring requirements is at the discretion of the appropriate Regional Board.

The Regional Board supports the efforts of the Mission Bay Technical Advisory Committee (TAC). On February 5, 2003; the Regional Board adopted a name change for the Order (Addendum No. 3 to Order No. 97-11) currently used to regulate the Mission Bay Landfill. The current title of the Order is as follows: "*General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Landfills Containing Hazardous and Nonhazardous Wastes within the San Diego Region.*" The staff proposed this name change with consideration of a specific request from the Mission Bay TAC to provide recognition that the Mission Bay Landfill is likely to contain hazardous materials and/or wastes. You can see the supporting information and materials prepared by our staff and provided for consideration by our Regional Board members (see ITEM No. 6) on our web site at:

<http://www.swrcb.ca.gov/rwqcb9/rb9board/feb03.html>

From participation of our staff at the Mission Bay TAC, we understand that the City of San Diego will contract for the completion of a site investigation to assess the current conditions at the Mission Bay Landfill. Further, our staff understands that the assessment will begin in October with results due back during July 2004. We look forward to reviewing the final site assessment report of results from that work.

The heading portion of this letter includes a Regional Board code number noted after "In reply refer to:" In order to assist us in the processing of your correspondence please include this code number in the heading or subject line portion of all correspondence and reports to the Regional Board pertaining to this matter.

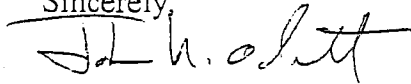
Mr. Wilks, Sierra Club- San Diego Chapter  
Request to Reclassify Mission  
Bay Landfill

- 3 -

August 4, 2003

I hope that this letter helps to explain our regulatory constraints and position with regard to taking further action upon the request made in your letters dated June 24, 2003 and July 9, 2003. If you have any questions regarding this letter, please contact Mr. Brian McDaniel (TEL: 858-627-3927 or via email at [mcdab@rb9.swrcb.ca.gov](mailto:mcdab@rb9.swrcb.ca.gov)).

Sincerely,



JOHN R. ODERMATT  
Senior Engineering Geologist, Land Discharge Unit

JRO:bkm

cc: Ms. Nicole Capretz, Office of the Council Representative for District 6, 202 C Street, 10<sup>th</sup> Floor, San Diego, CA 92101 (for distribution to all Mission Bay TAC members)

Mr. Chris Gonaver City of San Diego, Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123 (for distribution to all Mission Bay TAC members)



# California Regional Water Quality Control Board

## San Diego Region



on H. Hickox  
cretary for  
ironmental  
rotection

Internet Address: <http://www.swrcb.ca.gov/rwqcb9/>  
9174 Sky Park Court, Suite 100, San Diego, California 92123-4340  
Phone (858) 467-2952 • FAX (858) 571-6972

Gray Davis  
Governor

February 6, 2003

To: Interested/Affected Parties

Dear Representatives:

**RE: ADDENDUM NO. 3 TO ORDER 97-11 REVISING THE TITLE OF ORDER NO. 97-11 AND ADDENDA THERETO: "GENERAL WASTE DISCHARGE REQUIREMENTS FOR POST-CLOSURE MAINTENANCE OF INACTIVE NONHAZARDOUS WASTE LANDFILLS WITHIN THE SAN DIEGO REGION."**

On February 5, 2003, this Regional Board adopted tentative Addendum No. 3 to Order No. 97-11. Tentative Addendum No. 3 to Order 97-11 revises the title of the waste discharge requirements (WDRs) for inactive landfill sites under Order 97-11. This change is being implemented as a result of our review of the range wastes reportedly discharged into the waste management units (landfills) currently enrolled in Order 97-11.

The revised title for Order 97-11 is as follows:

*"General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Landfills Containing Hazardous and Nonhazardous Wastes within the San Diego Region."*

You are being sent a copy of Addendum No. 3 to Order 97-11 because you are either identified as a discharger responsible for a facility enrolled in Order 97-11, or the Regional Board has your name on an Interested Parties List for Order 97-11. If you are interested in reviewing the specific agenda materials for this action, please see the Regional Board agenda for February 5, 2003: Item No. 6 at the following address:

<http://www.swrcb.ca.gov/rwqcb9/rb9board/meetings.html>

Should you have any questions concerning the above matter, please contact Mr. John Odermatt at (858) 637-5595 or by email at [oderj@rb9.swrcb.ca.gov](mailto:oderj@rb9.swrcb.ca.gov).

Sincerely,

JOHN H. ROBERTUS

Executive Officer

JHR:jro

Enclosure: Addendum No. 3 to Order No. 97-11

Cc: Interested Parties List (see attached) with Enclosure

California Environmental Protection Agency

Recycled Paper





Interested Parties List  
Addendum No. 3 Order 97-11:  
General Waste Discharge Requirements,  
Inactive Landfills, San Diego Region

February 6, 2003

## INTERESTED/AFFECTED PARTIES LIST

Mr. Joe Mello  
Division of Clean Water Programs  
State Water Resources Control Board  
P. O. Box 944212  
Sacramento, CA 94244-2120

Ms. Kerry McNeill  
Department of Environmental Health  
County of San Diego  
9325 Hazard Way  
San Diego, CA 92123

Mr. Paul Manasjan  
City of San Diego  
Solid Waste Local Enforcement Agency  
Development Services  
1222 First Avenue (MS501)  
San Diego, CA 92101-4562

Mr. Jon Rollin  
Department of Public Works  
5469 Kearny Villa Road, #305  
San Diego, CA 92123

Mr. Gino Yekta  
CA Integrated Waste Management Board  
1001 I Street  
Sacramento, CA 95814

Mr. Safouh Sayed  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, CA 90630

Mr. Benjamin Guerrero  
Community Development Department  
City of Chula Vista  
276 Fourth Avenue  
Chula Vista, CA 91910

San Diego Association of Governments  
First Interstate Plaza  
401 B Street, Suite 800  
San Diego, CA 92101

Mr. Garth Koller  
City of San Marcos  
1 Civic Center Drive  
San Marcos, CA 92069-2949

Southwest Division Naval Facilities  
Engineering Command  
2585 Callagan Highway, Building 99  
Naval Station - San Diego  
San Diego, CA 92136-5198  
Attn: Mr. Robert Campbell

Navy Region Southwest  
Assistant Chief of Staff, Environmental  
Code N4512  
33000 Nixie Way, Bldg. 50, Suite 326  
San Diego, CA 92147-5110  
Attn: Ms Theresa Morley

Mr. Kevin Heaton  
Department of Environmental Health  
County of San Diego  
P.O. Box 129261  
San Diego, CA 92112-9261

Mr. Tim Dillingham  
CA Department of Fish and Game  
4949 Viewridge Avenue  
San Diego, CA 92123

Mr. Steve Wall  
U.S. Environmental Protection Agency  
(WST-7)  
75 Hawthorne Street  
San Francisco, CA 94105

Mr. Dave Byrnes  
Air Pollution Control District  
9150 Chesapeake Drive  
San Diego, CA 92123

Mr. Steve Fontana, Deputy Director  
City of San Diego - Environmental Serv Div.  
9601 Ridgeway Court, Suite 310  
San Diego, CA 92123

Rupinder Uppal and Sudeep Dhillon, Trustees  
The 333 Trust  
1007 Los Alisos North  
Fallbrook, CA 92028-3752

Mr. Tom Mulder  
ENV America Incorporated  
437 J Street  
San Diego, CA 92101

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

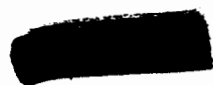
ADDENDUM NO. 3 TO ORDER NO. 97-11

GENERAL WASTE DISCHARGE REQUIREMENTS  
FOR POST-CLOSURE MAINTENANCE OF  
INACTIVE NONHAZARDOUS WASTE LANDFILLS  
WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

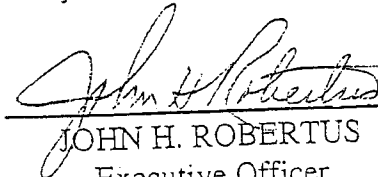
1. On April 9, 1997, this Regional Board adopted Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region*. Order No. 97-11 established landfill maintenance requirements and water quality monitoring for former landfills and burn sites that ceased operation prior to 1984.
2. Groundwater monitoring reports and pre-1984 historical data for landfills and burn sites covered under Order No. 97-11 indicate that wastes disposed into the facilities may have included significant quantities of wastes currently defined/characterized as "hazardous wastes", in addition to "designated", "nonhazardous" and or "inert" wastes.
3. The Regional Board has notified all dischargers and all known interested parties of its intent to add the term "hazardous" to the title of Order No. 97-11.
4. This action is exempt from the requirements of the California Environmental Quality Act (Public Resources Code 21000 et seq.) in accordance with Title 14, California Code of Regulations, Chapter 3, Section 15321.
5. The Regional Board, in a public meeting, heard and considered all comments pertaining to the proposed action.

IT IS HEREBY ORDERED,

1. Replace the title of Order No. 97-11 with the following: "General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Landfills Containing Hazardous and Nonhazardous Wastes within the San Diego Region."
- 

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 5, 2003.

Issued by:

  
\_\_\_\_\_  
JOHN H. ROBERTUS  
Executive Officer



# California Regional Water Quality Control Board

## San Diego Region

John H. Hickox  
Secretary for  
Environmental  
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb9/>  
9174 Sky Park Court, Suite 100, San Diego, California 92123-4340  
Phone (858) 467-2952 • FAX (858) 571-6972



Gray Davis  
Governor

December 14, 2001

Mr. Jon Rollin  
Inactive Waste Site Management  
Department of Public Works  
County of San Diego  
5469 Kearny Villa Road  
San Diego, CA 92123-1295

FILE: 06-0814.02

Dear Mr. Rollin:

**RE: ADDENDUM NO. 2 TO ORDER NO. 97-11, GENERAL WASTE DISCHARGE  
REQUIREMENTS FOR POST-CLOSURE MAINTENANCE OF INACTIVE  
NONHAZARDOUS WASTE LANDFILLS WITHIN THE SAN DIEGO REGION**

Enclosed is a copy of Addendum No. 2 to Order 97-11 which was adopted by the California Regional Water Quality Control Board (Regional Board) on December 12, 2001. Addendum No. 2 to Order No. 97-11 removes the San Ysidro burn site from regulation by waste discharge requirements for post-closure monitoring and maintenance.

Please note that the County of San Diego owns other facilities that are currently regulated by the requirements of Order 97-11. Addendum No. 2 to Order 97-11 also updates our mailing address for your future correspondence with the Regional Board.

If you have any questions or comments concerning this Addendum, please contact Mr. Brian McDaniel at (858) 627-3927.

Sincerely,

JOHN H. ROBERTUS  
Executive Officer

JHR:jro:bkm  
Enclosure /sanysidro

cc: Interested Parties List

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

ADDENDUM NO. 2 TO ORDER NO. 97-11

GENERAL WASTE DISCHARGE REQUIREMENTS  
FOR POST-CLOSURE MAINTENANCE OF  
INACTIVE NONHAZARDOUS WASTE LANDFILLS  
WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

1. On April 9, 1997, this Regional Board adopted Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region*. Order No. 97-11 established landfill maintenance requirements and water quality monitoring for former landfills and burn sites that ceased operation prior to 1984.
2. The former San Ysidro burn site was included in Order 97-11 as a former burn site that may contain soluble constituents which are leachable to waters of the state under acidic conditions. Potential water quality impacts from this site could result from erosion during the rainy season, if waste is exposed and is not contained onsite.
3. The burn site ceased operation in 1957 as an open burn dump for municipal wastes generated in the local surrounding area. Residual burn ash wastes were reclassified as a non-hazardous waste by the Department of Toxic Substances Control on April 3, 1998.
4. On May 4, 2001, the County of San Diego submitted a site closure report for the former burn site. The report confirmed the removal of the residual burn ash wastes in support of clean closure of the site. An estimated 17,775 cubic yards of burn ash were excavated and disposed at the Otay Class I Landfill.
5. The Regional Board has notified the discharger and all known interested parties of its intent to remove the former San Ysidro burn site from the requirements of Order No. 97-11 for the County of San Diego.

6. This action is exempt from the requirements of the California Environmental Quality Act (Public Resources Code 21000 et seq.) in accordance with Title 14, California Code of Regulations, Chapter 3, Section 15321.
7. The Regional Board, in a public meeting, heard and considered all comments pertaining to the proposed action.

**IT IS HEREBY ORDERED,**

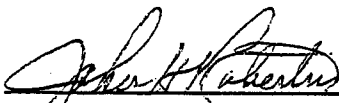
1. The San Ysidro burn site be removed from Order No. 97-11.
2. Replace the **REPORTING REQUIREMENTS Item E.10** with the following:

"The discharger shall submit reports required under this Order and other information requested by the Executive Officer, to:

California Regional Water Quality Control Board  
9174 Sky Park Court, Suite 100  
San Diego, CA 92123"

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on December 12, 2001.

issued by:

  
JOHN H. ROBERTUS  
Executive Officer  
December 12, 2001

INTERESTED PARTIES LIST  
ADDENDUM NO. 2 TO ORDER NO. 97-11

Mr. Robert Ferrier  
Environmental Services Department  
9601 Ridgehaven Court, Suite 310  
San Diego, CA 92123-1636

Mr. John Locke, IR Coordinator  
North Island Environmental Department  
N4512  
33000 Nixie Way, Bldg. 50, Suite 335  
San Diego, CA 92147-5110

Mr. Keith Forman, BRAC Coordinator  
BRAC Program Office, Code 05BS.KF  
1420 Kettner Boulevard, Suite 501  
San Diego, CA 92101-2404

Mr. Rick Adcock  
San Diego Unified Port District  
P. O. Box 488  
San Diego, California 92112

Mr. Garth Koller  
City of San Marcos  
1 Civic Center Drive  
San Marcos, CA 92069-2949

Mr. John Richards  
Office of the Chief Counsel  
State Water Resources Control Board  
Sacramento

Ms. Michele Stress  
Department of Environmental Health  
County of San Diego  
9325 Hazard Way  
San Diego, CA 92123

Mr. Gino Yekta  
California Integrated Waste Management Board  
Closure Branch  
3800 Cal Center Drive  
Sacramento, CA 95826

Ms. Patricia Henshaw  
Supervising Hazardous Waste Specialist  
County Of Orange  
Health Care Agency  
Local Solid Waste Enforcement Agency  
2009 E. Edinger Avenue  
Santa Ana, CA 92705

Ms. Patti Krebs  
Executive Director  
Industrial Environmental Association  
701 B Street, #1445  
San Diego, CA 92101

Mr. Haissam Salloum  
Department of Toxic Substances Control  
5796 Corporate Avenue  
Cypress, California 90630

San Diego Association of Governments  
First Interstate Plaza  
401 B Street, Suite 800  
San Diego, California 92101

Mr. Tim Dillingham  
California Department of Fish and Game  
4949 Viewridge Avenue  
San Diego, California 92123

Mr. David Hulse, Chief  
Department of Planning and Land Use  
County of San Diego  
5201 Ruffin Road, Suite B  
San Diego, California 92123-1666

Ms. Vicki Wilson, Director  
County of Orange, TWMD  
320 N. Flower Street, Suite 400  
Santa Ana, California 92703

Mr. Gary Hartnett  
Air Pollution Control District  
County of San Diego  
9150 Chesapeake Drive  
San Diego, California 92123-1096

Ms. Laura Hunter  
Environmental Health Coalition  
1717 Kettner Blvd., Suite 100  
San Diego, CA 92101

Ms. Mary Roush  
City of San Diego  
Planning Department  
Development and Environmental Planning  
1222 First Avenue, MS 501  
San Diego, California 92101

Ms. Lori Saldana  
Sierra Club, San Diego Chapter  
3820 Ray Street  
San Diego, CA 92104-3623

Mr. Craig Nicolaisen  
Rainbow Planning Group  
1934 Rice Canyon Road  
Fallbrook, CA 92028

Mr. Jon Rollin  
Inactive Waste Site Management, County of San Diego  
5469 Kearny Villa Road  
San Diego, CA 92123

Ms. Theresa Morley  
Navy Region Southwest Environmental, Code  
N4512.TM  
33000 Nixie Way, Bldg. 50, Suite 326  
San Diego, CA 92147-5110

Mr. John Herrle  
City of Oceanside, Engineering Department  
300 North Hill Street  
Oceanside, CA 92054

Mr. Tom Calhoun, Director  
San Diego Unified School District  
Office of the Director, Annex 2-101  
4100 Normal Street  
San Diego, CA 92103-2682

Dr. Harinder Grewal  
1007 Los Alisos North  
Fallbrook, CA 92028

Ms. Lisa Babcock  
Division of Clean Water Programs  
State Water Resources Control Board  
Sacramento

Mr. Paul Manasjan  
Solid Waste Local Enforcement Agency  
City of San Diego  
1222 First Avenue, MS501  
San Diego, CA 92101-4155

Mr. Mubashar Ahmad  
Waste Management Department  
County of Riverside  
1995 Market Street  
Riverside, California 92501-1719

Mr. Steve Moise  
County of Riverside  
Local Enforcement Agency  
P. O. Box 7600  
Riverside, CA 92513

Mr. Gordon Shackelford  
Lakeside Planning Group  
P. O. Box 2040  
Lakeside, CA 92040

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

ADDENDUM NO. 1 TO ORDER NO. 97-11

GENERAL WASTE DISCHARGE REQUIREMENTS  
FOR POST-CLOSURE MAINTENANCE OF  
INACTIVE NONHAZARDOUS WASTE LANDFILLS  
WITHIN THE SAN DIEGO REGION


The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

1. On April 9, 1997, this Regional Board adopted Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills Within the San Diego Region*. Order No. 97-11 established landfill maintenance requirements and water quality monitoring for landfills that ceased operation prior to 1984.
2. Order No. 97-11 lists two types of waste management units (WMUs) and owners of landfills and burn ash sites that are subject to general waste discharge requirements. During fiscal year 99/00, the Regional Board identified additional WMUs that need to be added to Order No. 97-11. This Addendum contains updated attachments of the newly identified owners of landfills subject to general waste discharge requirements.
3. Owners of landfill and/or burn ash sites that are subject to this Order, are responsible for the protection of usable waters from discharge of wastes, gases, and leachate, during the landfill maintenance period. This responsibility continues with subsequent change in reuse of the landfill for purposes other than open space.
4. Landfill cover at inactive landfills which ceased operation prior to 1984 may not be adequate to minimize percolation of liquids through wastes as described in Title 27, Section 20705.
5. The Rainbow Canyon Landfill is currently regulated by Order No. 89-101, *Waste Discharge Requirements for the Closure of Rainbow Canyon Waste Management Unit, RANPAC Engineering Corporation, Riverside County*. Order No. 89-101 established requirements for clean closure of a former burn dump. To date, the Regional Board has not received any indication that the clean closure of the burn ash will occur. In addition, the discharger has not paid annual fee for waste discharge requirements from 1993 to 1997. To ensure adequate maintenance is performed, the Rainbow Canyon Landfill would be more suitably regulated under Order No. 97-11.




6. The Regional Board has received notification from the Navy that the Old Marine Corp. Recruit Depot landfill will transfer ownership to the San Diego Unified Port District (SDUPD). The Navy has completed a "Finding of Suitability for Early Transfer" (FOSET) to document the assessment and evaluation of the environmental condition of the property and to determine the property's suitability for deed transfer. The SDUPD's plan for the inactive landfill include various airport uses, principally as a vehicle parking and staging area for shuttles, taxis, and airport employees. The transfer of ownership is reflected in Attachment No. 1 to this Addendum.
7. Inactive landfills are existing facilities and as such are exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Code of Regulations, Chapter 3, Article 19, Section 15301.
8. The Regional Board has considered all water resource related environmental factors associated with the discharge of waste associated with these inactive landfills.
9. The Regional Board has notified interested parties of its intent to amend landfill maintenance requirements for these inactive landfills.
10. The Regional Board, in a public meeting heard and considered all comments pertaining to landfill maintenance of these inactive landfills.

**IT IS HEREBY ORDERED,** That Order No. 97-11 be amended as follows:

1. Add the following as Prohibition B.6:  
  
B.6 The use of pressurized water lines overlying waste is prohibited unless the water lines are designed in accordance with Maintenance Specification C.17.
  2. Replace C. MAINTENANCE SPECIFICATIONS with the following:  
  
C. MAINTENANCE SPECIFICATIONS  
  
General Maintenance Requirements  
  
1. The discharger shall prepare a maintenance plan by January 1, 2001, which contains, but is not limited to, the following:  
  
a. The persons, companies, or agencies responsible for each aspect of landfill maintenance, along with their addresses and phone numbers.
- 


- b. Location maps indicating property boundaries and the existing limits of waste, internal roads, and structures inside the property boundary.
  - c. A location map of the current monitoring and control systems including drainage and erosion control systems and landfill gas monitoring and control systems.
  - d. A description of the methods, procedures, schedules and processes that will be used to maintain, monitor and inspect the landfill.
- 2. The landfill maintenance period shall continue until the Regional Board determines that remaining wastes in all waste management units (WMUs) will not threaten water quality.
  - 3. The discharger shall comply with all applicable requirements of Title 27, CCR, Subchapter 5, Article 2.
  - 4. The landfilled areas shall be adequately protected from any washout, erosion of wastes or cover material. The surface drainage system shall be designed to adequately handle the rainfall from a 100-year 24 hour storm event.
  - 5. The structural integrity and effectiveness of all containment structures and the existing cover shall be maintained as necessary to correct the effects of settlement or other adverse factors.
  - 6. Vegetation used at the site shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the existing cover.
  - 7. The migration of landfill gas from the site shall be controlled as necessary to ensure that landfill gases and gas condensate are not discharged to surface waters or ground waters. Condensate shall be collected and removed from the site except as defined in 27CCR Section 20090(e).

### Erosion Control

- 8. Annually, prior to the anticipated rainy season but not later than October 31, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion, ponding, flooding, or to prevent surface drainage from contacting or percolating through wastes at the facility. In addition, maintenance, and repairs necessitated by changing site conditions can be made at any time.
- 

9. Silt fences, hay bales, and other measures shall be used to control surface water runoff from landfill areas where landfill cover have been placed, and from areas where landfill containment system construction is occurring.
10. All areas, including surface drainage courses, shall be maintained to minimize erosion. Landfill cover shall be maintained to minimize percolation of liquids through wastes.

### Surface Drainage

11. Surface water runoff within the boundary of the landfill (i.e., precipitation that falls on the landfill cover) shall be collected by a system of berms, ditches, downchutes, swales and drainage channels, and shall be diverted off the landfill to either the detention basins or to the natural watercourses offsite.
  12. Surface drainage from tributary areas and internal site drainage from surface and subsurface sources shall not contact or percolate through waste and shall either be contained onsite or be discharged in accordance with applicable storm water regulations.
  13. Surface drainage from the landfill is subject to State Board Order No. 97-03-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, "Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities".
  14. Where flow concentrations result in erosive flow velocities, surface protection such as asphalt, concrete, riprap, silt fences or other erosion control material shall be used for protection of drainage conveyance features. Interim bench ditches shall be provided with erosion control material and riprap to control erosion where necessary.
  15. Where high velocities occur at terminal ends of downchutes or where downchutes cross the landfill cover access roads, erosion control material shall be applied to exposed soil surfaces.
  16. Energy dissipators shall be installed to control erosion at locations where relatively high erosive flow velocities are anticipated.
- 

Report Frequency

Semiannually

Annually

Report Period

April - September

October - March

April - March

Report Due

October 30


April 30

April 30

Monitoring reports shall be submitted to:

California Regional Water Quality Control Board  
San Diego Region  
9771 Clairemont Mesa Blvd., Suite A  
San Diego, CA 92124-1331

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on June 14, 2000.

  
\_\_\_\_\_  
JOHN H. ROBERTUS  
Executive Officer

No.	Landfill Name	Operation period	Facility Type	Site Address	Owner/ Operator	Address
8	Old Marine Corp. Recruit Depot	1950 - 1971	Class II-2 landfill	Naval Training Center	San Diego Unified Port District	Mr. Rick Adcock, San Diego Unified Port District, P.O. Box 120488, San Diego, CA 92112
11	Bell Jr. High	1963 - 1966	Class II-2 landfill	620 S. Briarwood, San Diego, CA 92139	San Diego Unified School District	Mr. Dossantoes, San Diego Unified School District, Facilities Development Department, Office of the Director, Annex 2-101, 4100 Normal Street, San Diego, CA 92103-2682
12	Bradley Park	1948 - 1968	Class II-2 landfill	Intersection of Rancho Santa Fe Road and Linda Vista, San Marcos, CA 92069	City of San Marcos	Mr. Garth Koller City of San Marcos 1 Civic Center Drive San Marcos, CA 92069-2949
13	Paradise Hills Park	1966-1967	Class II-2 landfill	Intersection of S side of Paradise Valley Rd and W side Potamac Street, SD, 92139	City of San Diego	Mr. Robert Ferrier, Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123-1636

No.	Site Name	Operation period	Facility Type	Site Address	Owner/Operator	Address
4	Cactus Park	1947 - 1959	burn dump	Ashwood Street (southeasterly side of park), Lakeside CA, 92040	County of San Diego	Jon Rollin, Inactive Waste Site Management, County of San Diego, 5469 Kearny Villa Road, San Diego, CA 92123
5	Rainbow Canyon Landfill	1950's - 1974	burn dump	NW1/4, Section 30, T8s, R2W, San Bernardino Base & Meridian Coordinate System	Dr. Harinder Grewal	Dr. Harinder Grewal, 1007 Los Alisos North, Fallbrook, CA 92028

CALIFORNIA WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

ORDER NO. 97-11  
GENERAL WASTE DISCHARGE REQUIREMENTS  
FOR POST-CLOSURE MAINTENANCE OF  
INACTIVE NONHAZARDOUS WASTE LANDFILLS  
WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

BACKGROUND

1. Nonhazardous solid waste landfills (which include former Class II-2 landfills, former Class III landfills and burn dumps) have been regulated by the State Water Resources Control Board and the Regional Boards since the 1960's. The applicable regulations governing landfills is California Code of Regulations, Title 23, Division 3, Chapter 15, **Discharges of Waste to Land** (23 CCR).
2. Pursuant to 23 CCR 2510 (g), landfills which are closed, abandoned, or inactive on the effective date of these regulations (November 1984) are not specifically required to be closed in accordance with Article 8 requirements. However, these landfills are subject to post-closure maintenance requirements in accordance with 23 CCR 2581(b) and (c).
3. Pursuant to 23 CCR Section 2510 (g), persons responsible for discharges at landfills ~~which are closed, abandoned, or inactive may be required to develop and implement a~~ monitoring program. If water quality impairment is found, such persons may be required to develop and implement a corrective action program based on the provisions of Chapter 15.
4. The Regional Board may require formal closure of a landfill in accordance with 23 CCR Articles 8 and 9 under the following conditions: a) when there is a proposed site development or land use change that jeopardizes the integrity of the existing cover; b) when water quality impairment is found, as part of a ground water monitoring program; or c) when nuisance conditions exist that warrant such activity.
5. Pursuant to California Water Code, Section 13263, this Regional Board issues waste discharge requirements for post-closure maintenance of inactive landfills. In accordance with Section 13263(d) the Regional Board may prescribe requirements although no Report of Waste Discharge has been filed.
6. California Water Code, Section 13273, required the State Water Resources Control Board to develop a ranked list of all known landfills throughout the state on the basis of the threat to water quality. Water Code Section 13273 required the operator of each solid waste disposal site on the ranked list to conduct and submit to the

appropriate Regional Board the results of a solid waste water quality assessment test (SWAT report) to determine if the site is leaking hazardous waste.

7. SWAT reports indicated that landfills (which were inactive prior to November 1984) which contain significant quantities of decomposable waste have leaked hazardous waste to ground water. Volatile organic constituents in ground water near the inactive landfills may have occurred through landfill gas migration. These impacts to ground water could cause a long-term loss of a designated beneficial use. Because of this potential impact to ground water quality, leaking inactive landfills are defined in Title 23, CCR, Section 2200 as a category "1" threat to water quality. A facility's "complexity" ranking is based on the type of facility. For inactive landfills, the complexity ranking is category "B".
8. Attachment No. 1 to this Order contains a list of persons who own or operated the inactive landfills that contain significant quantities of decomposable waste. Attachment No. 1 to this Order may be updated, as necessary, when additional information warrants.
9. Landfills that do not contain significant quantities of decomposable waste such as those which were operated by open burning of refuse may also impact water quality. However, the residual waste material may contain soluble constituents which are leachable to waters of the state under acidic conditions. Potential water quality impacts from these landfills could result from erosion during the rainy season, if waste is exposed and is not contained onsite. Surface water quality objectives may be exceeded in cases of extreme erosion of these landfill surfaces. Landfills that do not contain significant quantities of decomposable waste are a category "3" threat to water quality because potential discharges could degrade water quality without violating water quality objectives or cause a minor impairment of designated beneficial uses. The "complexity" rating is a category "C" for discharges that must comply with best management practices such as erosion control measures.
10. Attachment No. 2 to this Order contains a list of persons who own or operated these burn dumps that do not contain significant quantities of decomposable waste subject to these general waste discharge requirements. Attachment No. 2 to this Order may be updated, as necessary, when additional information warrants.
11. The issuance of this Order establishing general waste discharge requirements is consistent with the goal to provide water resources protection, enhancement and restoration while balancing economic and environmental impacts as stated in the Strategic Plan of the State Water Resources Control Board and the Regional Boards.
12. The issuance of this Order may supersede existing Orders which were issued to landfills which are in post-closure maintenance.



13. The adoption of general waste discharge requirements for inactive landfills for post-closure maintenance would assist in:
  - a. Protecting the ground waters and surface waters of the state from pollution or contamination.
  - b. Simplifying and expediting the application process for the discharger.
  - c. Reducing Regional Board time expended on preparing and considering individual waste discharge requirements for each project.

#### **Water Quality Control Plan**

14. The **Water Quality Control Plan Report, San Diego Basin (9)** (hereinafter Basin Plan), was adopted by this Regional Board on September 8, 1994, and subsequently approved by the State Water Resources Control Board (State Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the Regional Board and approved by the State Board. The Basin Plan designates beneficial uses and narrative and numerical water quality objectives, and prohibitions which are applicable to the discharges regulated under this Order.

#### **CEQA and Other Legal References**

15. Inactive landfills are existing facilities and as such are exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Code of Regulations, Chapter 3, Article 19, Section 15301.
16. The Regional Board, in establishing the requirements contained herein, considered factors including, but not limited to the following:
  - a. Past, present, and probable future beneficial uses of water.
  - b. Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
  - c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
  - d. Economic considerations.
  - e. The need for developing housing within the region.

- f. The need to develop and use recycled water.
  - g. Beneficial uses to be protected and water quality objectives reasonably required for that purpose.
  - h. Other waste discharges.
  - i. The need to prevent nuisance.
17. The Regional Board has considered all water resource related environmental factors associated with the discharge of waste associated with these inactive landfills.
18. The Regional Board has notified interested agencies and all know interested parties of its intent to issue post-closure maintenance requirements for these inactive landfills.
19. The Regional Board in a public meeting heard and considered all comments pertaining to post-closure maintenance of these inactive landfills.

**IT IS HEREBY ORDERED**, That each person identified in Attachment No. 1 or 2 to this Order (hereinafter discharger), in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

**A. ELIGIBILITY**

1. In order to add an inactive landfill to either Attachment 1 or 2 to this Order, the discharger shall submit a complete report of waste discharge (RWD) and an appropriate filing fee for each inactive landfill. The RWD shall include the following:
- a. Form 200, *Application for Facility Permit/Waste Discharge*, filled out in accordance with the instructions.
  - b. A discussion of the landfill and waste characteristics including:
    - Identification of the period during which waste was disposed of at the site;
    - Description of landfill disposal methods, operation and maintenance activities;
    - Description of types and quantities of waste disposed of;

- Identification of the total volume of waste disposed of at the site;
  - Any closure or post-closure activities conducted at the landfill subsequent to ceasing operation; and
  - Present and future land use of the inactive landfill.
- c. Documentation of how the discharger will comply with all applicable requirements of this Order for the inactive landfills in Attachment No. 1 & 2 to this Order.
- d. A topographical scale map showing the location, users and uses of all wells located within one mile of the inactive landfill.
- e. Any other information pertinent to protection of water quality or public health and prevention of nuisance.
2. The discharger shall receive authorization from the Regional Board which states that it is appropriate to regulate the inactive landfill under general waste discharge requirements, and an individual permit is not required. The authorization letter shall specify the following:
- a. Any modification to Monitoring and Reporting Program No. 97-11.
  - b. Any other conditions necessary to protect the beneficial uses of the receiving water.
3. It may be necessary for a discharger authorized under this Order to apply for and obtain an individual waste discharge requirement with more specific requirements. When an individual waste discharge requirements with specific requirements are issued to a discharger, the applicability of this general permit to the individual permittee shall be terminated on the effective date of the individual permit.
4. Notwithstanding the conditions specified above, individual cases may be brought to the Regional Board for consideration of waste discharge requirements when deemed appropriate by the Executive Officer.

## **B. PROHIBITIONS**

1. Discharges of wastes to lands which have not been specifically described to the Regional Board and for which valid Waste Discharge Requirements are not in force

are prohibited.

2. The discharge of waste shall not:
  - a. Cause the occurrence of coliform or pathogenic organisms in waters pumped from the basin;
  - b. Cause the occurrence of objectionable tastes and odors in waters pumped from the basin;
  - c. Cause waters pumped from the basin to foam;
  - d. Cause the presence of toxic materials in waters pumped from the basin;
  - e. Cause the pH of waters pumped from the basin to fall below 6.0 or rise above 9.0;
  - f. Cause this Regional Board's objectives for the ground or surface waters as established in the Basin Plan, to be exceeded; and
  - g. Cause pollution, contamination or nuisance or adversely affect beneficial uses of the ground or surface waters as established in the Basin Plan.
3. Odors, vectors, and other nuisances of waste origin beyond the limits of the landfill site are prohibited.
4. The discharge of waste to surface drainage courses or to usable ground water is prohibited.
5. Basin Plan prohibitions shall not be violated.

**C. POST-CLOSURE MAINTENANCE SPECIFICATIONS**

1. Annually, prior to the anticipated rainy season but not later than **October 31**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion, ponding, flooding, or to prevent surface drainage from contacting or percolating through wastes at the facility.
2. The landfilled areas shall be adequately protected from any washout, erosion of wastes or cover material. The surface drainage system shall be designed to adequately handle the rainfall from a 100-year 24 hour storm event.
3. Surface drainage from the landfill is subject to State Board Order No. 91-13-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, "Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities".

4. The structural integrity and effectiveness of all containment structures and the existing cover shall be maintained as necessary to correct the effects of settlement or other adverse factors.
5. Vegetation used at the site shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the existing cover. Landscaping overlaying the landfill portion of the site shall be shallow rooted native grasses and shrubs suited for inland valleys of Southern California.
6. The migration of landfill gas from the site shall be controlled as necessary to ensure that landfill gases and gas condensate are not discharged to surface waters or ground waters. Condensate shall be collected and removed from the site except as defined in 23CCR Section 2511(e).

#### D. PROVISIONS

##### 1. GENERAL PROVISION

Neither the treatment nor the discharge of waste shall create a pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code.

##### 2. DUTY TO COMPLY

The discharger shall comply with all conditions of this Order and any additional conditions prescribed by the Regional Board in addenda thereto. Any noncompliance with this Order constitutes a violation of the California Water Code and is grounds for: (a) enforcement action; (b) termination, revocation and reissuance, or modification of this Order; or (c) denial of a Report of Waste Discharge in application for new or revised Waste Discharge Requirements.

##### 3. COMPLIANCE

In an enforcement action, it shall not be a defense for the discharger to say, it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order.

##### 4. CORRECTIVE ACTION

The discharger shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

5. PROPER OPERATION AND MAINTENANCE

The discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate laboratory and process controls including appropriate quality assurance procedures.

6. PERMIT REVISION

This Order may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

- a. Violation of any terms or conditions of this Order;
- b. Obtaining this Order by misrepresentation or failure to disclose fully all relevant facts; or
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.


The filing of a request by the discharger for the modification, revocation and reissuance, or termination of this Order, or notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

7. CHANGE IN OWNERSHIP

This Order is not transferable to any person except after notice to the Executive Officer. The Regional Board may require modification or revocation and reissuance of this Order to, change the name of the discharger and incorporate such other requirements as may be necessary under the California Water Code. The discharger shall submit notice of any proposed transfer of this Order's responsibility and coverage as described under Reporting Requirement E.3.

8. PROPERTY RIGHTS

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the discharger from liability under federal, state, or local laws, nor create a vested right for the owner and operator to continue the regulated activity.



9. ENTRY AND INSPECTION

The discharger shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the discharger premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
- d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order or as otherwise authorized by the California Water Code, any substances or parameters at any location.

10. PERMIT REPOSITORY

A copy of this Order shall be maintained at the local offices of the discharger and shall be available to operating personnel at all times.

11. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.

12. EFFECTIVE DATE

This Order becomes effective on the date of adoption by the Regional Board. This Order supersedes Order Nos. 85-78 and 87-50.

E. REPORTING REQUIREMENTS

1. CHANGE IN DISCHARGE

The discharger shall file the following reports in accordance with the following schedule:

## a. Report of Waste Discharge

The discharger shall file a new Report of Waste Discharge at least 120 days prior to the following:

- 1) Significant change in post-closure maintenance activities which would significantly alter existing drainage patterns and slope configurations, or pose a potential threat to the integrity of the site;
- 2) Change in land use other than as described in the findings of this Order;
- 3) Significant change in disposal area, e.g. excavation and relocation of waste on site; or
- 4) Any planned change in the regulated facility or activity which may result in noncompliance with this Order.

## b. Workplan

The discharger shall submit a workplan at least 30 days prior to any maintenance activities that could alter existing surface drainage patterns or change existing slope configurations. These activities may include, but not be limited to, significant grading activities, the importation of fill material, the design and installation of soil borings, ground water monitoring wells and other devices for site investigation purposes.


## c. Written Notification

The discharger shall provide written notification at least 2 working days prior to any maintenance activities that are minor and/or routine in nature, do not add a significant amount of water, do not inhibit drainage, have limited potential for impacts to beneficial use of water, and will not interfere with future routine maintenance. These activities may include, but not be limited to:

- 1) routine maintenance grading and dust control;
- 2) landscaping with minimal/no water application;
- 3) gas surveys with temporary probes; or
- 4) replacement/removal of gas collection wells.

2. GENERAL REPORTING REQUIREMENT

The discharger shall furnish to the Executive Officer, within a reasonable time, any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The discharger shall also furnish to the Executive Officer upon request, copies of records required to be kept by this Order.





3. CHANGE IN OWNERSHIP

The discharger shall notify the Executive Officer, in writing, at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage between the current owner and new owner for construction, operation, closure, or post-closure maintenance of a landfill. This agreement shall include an acknowledgement that the existing owner is liable for violations up to the transfer date and that the new owner is liable from the transfer date on. The agreement shall include an acknowledgement that the new owners shall accept responsibility for compliance with this Order which includes the post-closure maintenance of the landfill.

4. INCOMPLETE REPORTS

Where the discharger becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information.

5. ENDANGERMENT OF HEALTH AND ENVIRONMENT


The discharger shall report any noncompliance which may endanger health or the environment. Any such information shall be provided verbally to the Executive Officer within 24 hours from the time the owner becomes aware of the circumstances. A written submission shall also be provided within five days of the time the owner becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, or prevent recurrence of the noncompliance. The Executive Officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. SLOPE FAILURE

The discharger shall notify the Executive Officer immediately of any slope failure occurring in a waste management unit. Any failure which threatens the integrity of the containment features or the waste management unit shall be promptly corrected after approval of the method and schedule by the Executive Officer.

7. LANDFILL GAS

The discharger shall operate and maintain a landfill gas migration control and detection system as required by the Air Pollution Control District (APCD) and the Local Enforcement Agency (LEA).



8. MONITORING AND REPORTING PROGRAM

The discharger shall comply with the attached Monitoring and Reporting Program No. 97-11. Monitoring results shall be reported at the intervals specified in Monitoring and Reporting Program No. 97-11.

9. REPORT DECLARATION

All applications, reports, or information submitted to the Executive Officer shall be signed and certified as follows:

- a. The Report of Waste Discharge shall be signed as follows:
  1. **For a corporation** - by a principal executive officer of at least the level of vice-president.
  2. **For a partnership or sole proprietorship** - by a general partner or the proprietor, respectively.
  3. **For a municipality, state, federal or other public agency** - by either a principal executive officer or ranking elected official.
  4. **For a military installation** - by the base commander or the person with overall responsibility for environmental matters in that branch of the military.
- b. All other reports required by this Order and other information required by the Executive Officer shall be signed by a person designated in paragraph (a) of this provision, or by a duly authorized representative of that person. An individual is a duly authorized representative only if:
  1. The authorization is made in writing by a person described in paragraph (a) of this provision;
  2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity; and
  3. The written authorization is submitted to the Executive Officer.
- c. Any person signing a document under this Section shall make the following certification:

" I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

10. REGIONAL BOARD ADDRESS

The discharger shall submit reports required under this Order and other information requested by the Executive Officer, to:

California Regional Water Quality Control Board  
San Diego Region  
9771 Clairemont Mesa Blvd., Suite A  
San Diego, California 92124-1331

F. Notifications

1. U.S. EPA REVIEW


These requirements have not been officially reviewed by the United States Environmental Protection Agency and are not issued pursuant to Section 402 of the Clean Water Act.

2. CIVIL MONETARY REMEDIES

The California Water Code provides that any person who intentionally or negligently violates any Waste Discharge Requirements issued, reissued, or amended by this Regional Board is subject to administrative civil liability of up to 10 dollars per gallon of waste discharged, or if no discharge occurs, up to 1000 dollars per day of violation. The Superior Court may impose civil liability of up to 10,000 dollars per day of violation or, if a cleanup and abatement order has been issued, up to 15,000 dollars per day of violation.

3. PENALTIES FOR INVESTIGATION, MONITORING OR INSPECTION VIOLATIONS

The California Water Code provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this Order, or falsifying any information provided in the monitoring reports is guilty of a misdemeanor and may be subject to administrative civil liability of up to 1000 dollars per day of violation.



4. OTHER CLOSURE REGULATIONS

Closure of this waste management unit may be subject to regulations of the California Integrated Management Board and the San Diego County Air Pollution Control District.

5. CHAPTER 15 DEFINITIONS

Definitions of terms used in this Order shall be as set forth in California Code of Regulations Chapter 15.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on April 9, 1997.

  
\_\_\_\_\_  
JOHN H. ROBERTUS  
Executive Officer

CALIFORNIA WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

MONITORING AND REPORTING PROGRAM NO. 97-11  
FOR POST-CLOSURE MAINTENANCE OF  
INACTIVE NONHAZARDOUS WASTE LANDFILLS  
WITHIN THE SAN DIEGO REGION

A. MONITORING PROVISIONS

1. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer. Specific methods of analysis must be identified. If methods other than U. S. EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Executive Officer prior to use. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.
2. If the discharger monitors any pollutants more frequently than required by this Order, using the most recent version of Standard U. S. EPA Methods, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharger's monitoring report. The increased frequency of monitoring shall also be reported.
3. The discharger shall report all instances of noncompliance not reported under ~~Reporting Requirement E.5 of this Order at the time monitoring reports are submitted.~~ The reports shall contain the information listed in Reporting Requirement E.5.
4. Sample collection, storage, and analysis shall be performed according to the most recent version of Standard U. S. EPA Methods, and in accordance with an approved sampling and analysis plan.
5. All monitoring instruments and equipment which are used by the discharger to fulfill the prescribed monitoring program shall be properly calibrated and maintained as necessary to ensure their continued accuracy.
6. The discharger shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Executive Officer.

7. Records of monitoring information shall include:
  - a. The date, identity of sample, Monitoring Point from which it was taken, and time of sampling or measurement;
  - b. The individual(s) who performed the sampling or measurements;
  - c. Date and time that analyses were started and completed, and the name of the personnel performing each analysis;
  - d. The analytical techniques or method used, including method of preserving the sample and the identity and volumes of reagents used;
  - e. Calculation of results; and
  - f. Results of analyses, and the MDL for each parameter.
  - g. Laboratory quality assurance results (e.g. percent recovery, response factor)
8. The monitoring reports shall be signed by an authorized person as required by Reporting Requirement E.9.

#### B. SITE MAINTENANCE

- ~~1. The discharger shall perform quarterly inspections of the landfill site and report the~~  
results **semi-annually**. The report shall contain information on the sites condition and a discussion of any significant findings with regard to:

- a) General site condition;
- b) Surface cover and slope;
- c) Drainage facilities;
- d) Ground water and vadose zone monitoring networks;
- c) Methane gas control system;
- f) Observation of seepage from the site; and
- g) Maintenance activities at the site.

#### C. GROUND WATER DETECTION MONITORING PROGRAM

1. The ground water detection monitoring program contained in this section may be waived by the Executive Officer for: 1) inactive landfills that do not contain significant quantities of decomposable waste; or 2) landfills which have demonstrated through either completion of a SWAT questionnaire or a SWAT report that has been no discharge of hazardous substances to ground water.

2. The discharger shall establish and maintain ground water wells at the landfill site to be used as part of the water quality monitoring program.
3. Prior to pumping monitoring wells for sampling, the static water level shall be measured in each well.
4. Prior to sampling monitoring wells, the presence of a floating immiscible layer in all wells shall be determined at the beginning of each sampling event. This shall be done prior to any other activity which may disturb the surface of the water in a well, e.g. water level measurements. If an immiscible layer is found, the Regional Board shall be notified within 24 hours.
5. The discharger shall submit a compliance evaluation summary of the ground water data obtained. The summary shall contain a table which includes the following information:
  - a. Monitoring parameters;
  - b. Detection limit of monitoring equipment;
  - c. Measured concentrations found in the current sampling event
6. Water samples from the compliance points shall be collected, analyzed, and reported as shown in C.8 below.
7. For each monitored ground water body, the discharger shall measure the water level in each well and determine ground water flow rate and direction at least semi-annually, including the times of expected highest and lowest elevations of the water level for the respective ground water body. Ground water elevations for all background and downgradient wells for a given ground water body shall be measured within a period of time short enough to avoid temporal variations in ground water flow which could preclude accurate determination of ground water flow rate and direction.
8. The discharger shall submit a list of constituents to be monitored within 60 days of receipt of this Order. Ground water monitoring shall be conducted semiannually and monitoring results shall be submitted in accordance with Section E of this Monitoring and Reporting Program.

#### **D. REPORTS TO BE FILED WITH THE BOARD**

All reports shall be submitted no later than one month following the end of their respective Reporting Period. The reports shall be comprised of at least the following in addition to the specific contents listed for each respective report type:

1. **Transmittal Letter**

A letter summarizing the essential points shall be submitted with each report. The transmittal letter shall include:

- a. A discussion of any requirement violations found since the last such report was submitted and shall describe actions taken or planned for correcting the violations. If the discharger has previously submitted a detailed time schedule for correcting said requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter; and
- b. A statement certifying that, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct. This statement shall be signed by an individual that meets the requirements contained in Reporting Requirement E.9.

2. **Semi-Annual Report**

The semi-annual report shall contain, but not be limited to the following:

- a. Site maintenance outlined in section B of this Monitoring and Reporting Program.
- b. Groundwater analysis and flow rate outlined in section C of this Monitoring and Reporting Program.
- c. A map (or copy of an aerial photograph) showing the locations of observation stations, Monitoring Points, and Background Monitoring Points.

3. **Annual Summary Report**

The discharger shall submit an annual report to the Regional Board covering the previous monitoring year. The annual Reporting Period ends March 31.

- a. For each monitoring point, submit in graphical format the laboratory analytical data for all samples taken within at least the previous four calendar years. Each graph shall plot the concentration of the constituent over time for a given monitoring point, at a scale appropriate to show trends or variations in water quality.
- b. A comprehensive discussion of the compliance record, result of any corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.



No.	Landfill Name	WDID No.	Operation period	Facility Type	Site Address	Owner/ Operator	Address
1	Arizona/Balboa	6-0003.02	1935-36, 1952-74	Class II-2 landfill	2781 Pershing Drive, San Diego, CA 92101	City of San Diego	Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123-1636
2	Chollas, South	6-0007.02	1951-81	Class II-2 landfill	2781 Camito Chollas, San Diego, CA 92105	City of San Diego	Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123-1636
3	Encinitas	6-0017.02	1967-77	Class II-2 landfill	2099 Encinitas Blvd., Encinitas CA 92024	County of San Diego	Joseph Minner, Deputy Director, Dept of Public Works, County of San Diego, 5555 Overland Ave., MS 0383, San Diego, CA 92123-1295
4	Gillespie		1940-64	Class II-2 landfill	1706 Cuyamaca St., El Cajon, CA 92020	County of San Diego	Joseph Minner, Deputy Director, Dept of Public Works, County of San Diego, 5555 Overland Ave., MS 0383, San Diego, CA 92123-1295
5	Golf Course	6-0020.02	1940s-1965	Class II-2 landfill	Naval Air Station, North Island	US Department of the Navy	Commanding Officer, Naval Air Station, Environmental Compliance Division, P. O. Box 357040, San Diego, CA 92135-7040
6	Sweetwater I Hillsborough	6-1090.02	1948-62	Class II-2 landfill	Manzana Way, San Diego, CA 92139	County of San Diego	Joseph Minner, Deputy Director, Dept of Public Works, County of San Diego, 5555 Overland Ave., MS 0383, San Diego, CA 92123-1295
7	Maxson Street	6-0023.02	1960-69	Class II-2 landfill	300 North Coast Highway, Oceanside, CA 92054	City of Oceanside	James Stillman, City of Oceanside, Division Manager, Engineering Department, 300 North Hill Street, Oceanside, CA 92054
8	Old Marine Corp Recruit Depot	6-0035.02	1950-71	Class II-2 landfill	Naval Training Center	US Marine Corps	Commanding Officer, Attn: Keith Forman, Interim BEC, Naval Training Center, 33502 Decatur Road, Suite 120, San Diego, CA 92122-1449
9	SERE Camp	6-0047.02	1978 - 1982	Class II-2 landfill	SERE Camp, Warner Springs	US Department of the Navy	Commanding Officer, Naval Air Station, Environmental Compliance Division, P. O. Box 357040, San Diego, CA 92135-7040
10	Mission Bay	6-378.02	1952 - 1959	Class II-2 landfill	Mission Bay, Sea World Drive, San Diego, CA 92109	City of San Diego	Environmental Services Department, 9601 Ridgehaven Court, Suite 310, San Diego, CA 92123-1636

No.	Site Name	WDID No.	period	Type	Site Address	Operator	Address
1	Admiral Baker		1965-late 70s	solid waste landfill	Admiral Baker golf course	Dept of the Navy	Department of the Navy, Commanding Officer, Naval Station San Diego, 3395 Sturevant St., Suite 6, San Diego, CA 92136-5071
2	Old Spanish Bight	6-0030.02	1917-40s	burn dump	Naval Air Station, North Island	US Department of the Navy	Commanding Officer, Naval Air Station, Environmental Compliance Division, P. O. Box 357040, San Diego, CA 92135-7040
3	San Ysidro		1947-1957	burn dump	S. Otay Mesa Rd and E. of Interstate 805	County of San Diego	Joseph Minner, Deputy Director, Dept of Public Works, County of San Diego, 5555 Overland Ave., MS 0383, San Diego, CA 92123-1294

- c. A written summary of the monitoring results and monitoring system(s), indicating any changes made or observed since the previous annual report.
- d. A topographic map at appropriate scale, showing the direction of ground water flow at the landfill site.

E. **REPORTING**

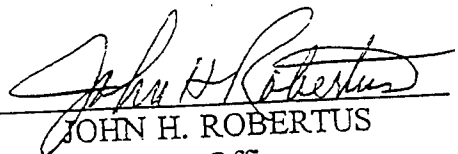
Monitoring reports shall be submitted to the Executive Officer in accordance with the following schedule:

<u>Report Frequency</u>	<u>Report Period</u>	<u>Report Due</u>
Semiannually .	April - September	30 Days after the reporting period.
Annually	April - March	

Monitoring reports shall be submitted to:

California Regional Water Quality Control Board  
San Diego Region  
9771 Clairemont Mesa Blvd., Suite A  
San Diego, CA 92124-1331

Ordered by

  
JOHN H. ROBERTUS  
Executive Officer  
April 9, 1997



# California Regional Water Quality Control Board

## San Diego Region

ston H. Hickox  
Secretary for  
Environmental  
Protection

Internet Address: <http://www.swrcb.ca.gov/rwqcb9/>  
9771 Clairemont Mesa Boulevard, Suite A, San Diego, California 92124-1324  
Phone (858) 467-2952 • FAX (858) 571-6972



04-13-00 14:48 RCVD

April 11, 2000

Mr. James P. Miller, Jr.  
Mission Bay Park Toxic Cleanup  
P.O. Box 60026  
San Diego, CA

*File Copy*  
*4/20*

FILE: 06-378

CC: Ray P.

Dear Mr. Miller:

### MISSION BAY LANDFILL

Thank you for your letter dated March 8, 2000. You asked the Regional Board to begin immediate cleanup of industrial wastes, contaminated soil, and contaminated groundwater at the Mission Bay Landfill located along the southern boundary of the Bay. You asked for these actions on behalf of the citizen group, the Mission Bay Park Toxic Cleanup. Mr. Scott Andrews delivered the letter to the Regional Board during the Public Forum of the Regional Board meeting held March 8, 2000.

In the letter you stated "levels of heavy metals in the sediments have put Mission Bay in solid company with one of the most highly polluted water bodies in the nation." You identified a seismic hazard at the landfill which "would likely usher in a whole new episode of water contamination, possibly of catastrophic proportions." Please consider the following comments:

#### Background history of Mission Bay Landfill

The Mission Bay Landfill was operated by the City of San Diego from 1960 to 1970.

Mr. Miller

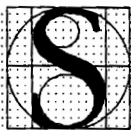
- 3 -

April 11, 2000

based on the most recent monitoring report dated October 1999. The City of San Diego is currently monitoring the site on a quarterly basis for VOC's, inorganic and general parameters (pH, nitrogen, sulfate, arsenic, and chromium). Low concentrations of VOC's (MTBE, diethyl ether, dichloroethene) have been detected in several monitoring wells, however these compounds are believed to be from gasoline powered boats in Mission Bay and construction activities at Sea World. Regional Board staff generally concur with this evaluation.

#### Bay Protection Program

You requested the Regional Board take immediate action to clean up the site under the Bay Protection and Toxic Cleanup Program. The California State Water Resources Control Board adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999 under this program. In the



Alfred C. Ströhlein  
3559 Jewell Street  
San Diego, CA 92109-6723

Phone & Fax: 858/274-2362

E-mail: alstro@adnc.com

**RECEIVED**

California Coastal Commission  
7575 Metropolitan St., Ste. 103  
San Diego, CA 92108-4402

SEP 02 2003

Via Fax: 619/767-2384

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Dear Commissioners:

September 1, 2003

**(SeaWorld) PERMIT REVOCATION: R-6-01-129**

The toxic waste dump upon which the "Splashdown" ride now rests has been known for years. The city, in cooperation with Anheuser-Busch, was to conduct several dozen test bores *prior to* granting a permit to expand the Adventure Park eastward by 16.5 acres. When these tests proved positive for the presence of toxic substances, *they were abandoned*. The proposed expansion of the park was not.

During the Second World War, the site had been used as a small military airstrip. During and after the war, the site had become a public trash-disposal area and used to bury hundreds of 55-gallon drums containing toxic waste.

In short, the site now being used to expand the Adventure Park is a toxic disaster waiting to happen. E.g.: when tests were conducted in 2002, hydrogen sulfide registered **1820 ppm** whereas **100 ppm** is deemed lethal!


Furthermore, in its responses to an environmental report, representatives of Anheuser-Busch failed to identify that the Splashdown site was located within a public park; that species were endangered; and that sensitive habitat would be disturbed. The Coastal staff relied on these and other comments to recommend to the Commission that it *oppose* the Revocation.

Until the site is cleaned of toxic waste and made safe for public use (without risking any more deaths from hydrogen sulfide), please revoke the permit and demand that Anheuser-Busch remove the structures associated with the "Splashdown" ride and other facilities.

Sincerely,

/s/ **Al Strohlein**

Alfred C. Strohlein

EXHIBIT NO. <b>6</b>
APPLICATION NO. <b>6-01-129</b>
Letters Supporting Revocation
 California Coastal Commission

RECEIVED

SEP 6 2 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

agenda # -  
application # 6-01-129  
maire Blackford - opposition

4355 Loma Riviera Ct  
San Diego CA 92110

Dear Coastal Commission,

Please do not allow Sea World  
to build a Splash Down water ride.

Loma Riviera condominiums  
are about  $\frac{1}{4}$  mile air space  
from Sea World. The condos  
were built starting 1964.

We have heard Sea World's noise  
for some time now, but a splash  
down ride really is too much,  
with all the screaming.

Please consider the location  
before you approve this horrible  
thing.

Sincerely

Maire Blackford

EL  
RECEIVED

SEP 03 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

SeaWorld R-601-129

Ellen Wade  
1572 Sunset Cliffs Blvd.  
San Diego, CA 92107  
OPPOSED TO PROJECT

To the CA Coastal Commission and all concerned,

Please REVOKE the SeaWorld Splashdown towers and anything else exceeding the 30ft. height limit. It is uncharacteristic of the beach area. It already looks bad and is distracting. This is not what the people who live here want. Seaworld does not need rides to continue their educational status. They need not be a theme park competing with Disney World. This sets a bad precedent!

Thank you for your efforts.

Sincerely,

Ellen Wade & Family



Catherine A. Strohle in  
3559 Jewell Street  
San Diego CA 92109-6723

Phone: 858/274-2362  
Fax: 858/274-2361  
e-mail: cathstro@adnc.com

RECEIVED

SEP 04 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

September 4, 2003

Thu 10a

CALIFORNIA COASTAL COMMISSION  
San Diego District  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4421

Re: Revocation of SeaWorld's splash down ride.

There are many reasons to halt this construction, most importantly because of the instability and contamination of the substrata. When one adds to that the effect of the noise on bay area residents from Loma Portal to Mission and Pacific Beach, the problem is more evident.

Knowing as we now do that the prescribed environmental study was never completed, that SeaWorld actually exacerbated the contamination by piercing chemical-filled drums, we are increasingly hostile to any future development on what SeaWorld considers to be its land.

SeaWorld is not the good neighbor it claims to be. It assaults us with fireworks every night in summer and every weekend the rest of the year. It takes up acres of parkland for parking. This is especially infuriating because when it was suggested to them several years ago that they could build a multi-story garage and leave more parkland available, they claimed the ground was unable to support such a weight. The city gave them extra land after hearing that argument. Now their long-term plans call for building a garage.

Their rent is too low, their impact is too high and their veracity is, to say the least, questionable. I urge you to uphold the revocation.

*Catherine A Strohle in*



CALIFORNIA COASTAL COMMISSION  
San Diego Coast District  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4421

RECEIVED

SEP 6 8 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Agenda No.: Th 10a

Application No.: R-6-01-129

Name: *May Berman*

Approve the Revocation Request

September 4, 2003

RE: SeaWorld Splashdown Ride

Dear Commissioners:

Pursuant to California Code of Regulations, Title 14 Division 5.5 section 13105 I am hereby requesting that you revoke SeaWorld of California's permit to construct a so called splash down water ride. *Please note that technically this description is inaccurate as the ride is actually a roller coaster tracked ride with the tracks partially immersed in a water flume.*

The grounds for revocation include (a) intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application.

It is well established that information furnished in the E.I.R. of 6/5/2001 by the applicant on this project was knowingly scientifically inaccurate. To wit the following items:

- (1) The E.I.R. studies were performed for the city by contractors paid for by the SeaWorld. Their approval by the city was conflicted by the department performing the evaluations major source of revenue being from large developers and/or applicants like SeaWorld. Both situations are conflicts of interest.
- (2) Aside from the flawed toxic waste evaluation is the inaccurate noise analysis. Evaluations by SANDAG refute the ambient freeway noise levels presented by Gordon Bricken & Associates when measured at the closest residential point to the splashdown ride (4371 Loma Riviera Court, 92110)
- (3) The air pollution monitoring station cited in the E.I.R. of 6/5/2001 is located South East of the convention center and it's air quality data in no way relates to the I-5/I-8 traffic area accesses adjacent to SeaWorld. The West bound traffic that uses I-8 Ingraham exit to SeaWorld was ignored. Both instances when pointed out to the city were fraudulently ignored by city hall staff.

Beyond all of the above is the fact that when the re-siting of the Splashdown ride took place (moving it from the June 2001 E.I.R. location in the Northeasterly corner of the park to the area immediately East of the entrance) there was no new E.I.R report prepared and circulated to the public and/or public oversight bodies adjoining SeaWorld. Such as the Peninsula Community Planning Board and The Loma Riviera Community Association Board of Directors.

The Summary of Staff Recommendation is completely without merit when measured by the intent of the standards set forth in the grounds for revocation of permit parts (a) and (b). The clear and foremost duty of this commission is to protect the general public from the obvious intent of SeaWorld to obscure the facts through it's contractors and financial influence on the staff at the city hall of San Diego.

As intentially erroneous information was presented to the coastal commission by the SeaWorld advocates this obviously resulted in an erroneous decision to approve the Splashdown in it's original location. The failure to observe the proper evaluative procedures for relocating it to a more noise objectionable location (closer proximity to Point Loma homeowners) is sufficient in itself to revoke the SeaWorld permit.

Sincerely yours,

(Name)

*May Berman*

(Address)

*4351 Loma Riviera Ct*

(City, State, Zip)

*San Diego CA 92110*

LETTERS SUPPORTING  
REVOCATION

CALIFORNIA COASTAL COMMISSION

San Diego Coast District  
7575 Metropolitan Drive, Suite 103  
San Diego, CA 92108-4421

RECEIVED

SEP 08 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Agenda No.: Th 10a

Application No.: R-6-01-129

Name: MARIE BLACKFORD

Approve the Revocation Request

September 4, 2003

RE: SeaWorld Splashdown Ride

Dear Commissioners:

Pursuant to California Code of Regulations, Title 14 Division 5.5 section 13105 I am hereby requesting that you revoke SeaWorld of California's permit to construct a so called splash down water ride. *Please note that technically this description is inaccurate as the ride is actually a roller coaster tracked ride with the tracks partially immersed in a water flume.*

The grounds for revocation include (a) intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application.

It is well established that information furnished in the E.I.R. of 6/5/2001 by the applicant on this project was knowingly scientifically inaccurate. To wit the following items:

- (1) The E.I.R. studies were performed for the city by contractors paid for by the SeaWorld. Their approval by the city was conflicted by the department performing the evaluations major source of revenue being from large developers and/or applicants like SeaWorld. Both situations are conflicts of interest.
- (2) Aside from the flawed toxic waste evaluation is the inaccurate noise analysis. Evaluations by SANDAG refute the ambient freeway noise levels presented by Gordon Bricken & Associates when measured at the closest residential point to the splashdown ride (4371 Loma Riviera Court, 92110)
- (3) The air pollution monitoring station cited in the E.I.R. of 6/5/2001 is located South East of the convention center and it's air quality data in no way relates to the I-5/I-8 traffic area accesses adjacent to SeaWorld. The West bound traffic that uses I-8 Ingraham exit to SeaWorld was ignored. Both instances when pointed out to the city were fraudulently ignored by city hall staff.

Beyond all of the above is the fact that when the re-siting of the Splashdown ride took place (moving it from the June 2001 E.I.R. location in the Northeasterly corner of the park to the area immediately East of the entrance) there was no new E.I.R report prepared and circulated to the public and/or public oversight bodies adjoining SeaWorld. Such as the Peninsula Community Planning Board and The Loma Riviera Community Association Board of Directors.

The Summary of Staff Recommendation is completely without merit when measured by the intent of the standards set forth in the grounds for revocation of permit parts (a) and (b). The clear and foremost duty of this commission is to protect the general public from the obvious intent of SeaWorld to obscure the facts through it's contractors and financial influence on the staff at the city hall of San Diego.

As intentially erroneous information was presented to the coastal commission by the SeaWorld advocates this obviously resulted in an erroneous decision to approve the Splashdown in it's original location. The failure to observe the proper evaluative procedures for relocating it to a more noise objectionable location (closer proximity to Point Loma homeowners) is sufficient in itself to revoke the SeaWorld permit.

Sincerely yours,

(Name)

Marie Blackford

(Address)

4355 Loma Riviera Ct

(City, State, Zip)

San Diego CA 92110

R. Jarvis Ross  
4352 Loma Riviera Court  
San Diego, CA 92110

RECEIVED

SEP 08 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Agenda No.: Th 10a  
Application No.: R-6-01-129  
Name: R. Jarvis Ross  
Approve the Revocation Request  
September 4, 2003

RE: SeaWorld Splashdown Ride

Dear Commissioners:

Pursuant to California Code of Regulations, Title 14 Division 5.5 section 13105 I am hereby requesting that you revoke SeaWorld of California's permit to construct a so called splash down water ride. *Please note that technically this description is inaccurate as the ride is actually a roller coaster tracked ride with the tracks partially immersed in a water flume.*

The grounds for revocation include (a) intentional inclusion of inaccurate, erroneous or incomplete information in connection with a coastal development permit application.

It is well established that information furnished in the E.I.R. of 6/5/2001 by the applicant on this project was knowingly scientifically inaccurate. To wit the following items:

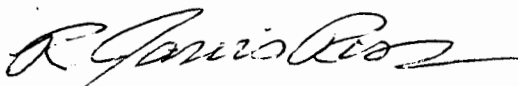
- (1) The E.I.R. studies were performed for the city by contractors paid for by the SeaWorld. Their approval by the city was conflicted by the department performing the evaluations major source of revenue being from large developers and/or applicants like SeaWorld. Both situations are conflicts of interest.
- (2) Aside from the flawed toxic waste evaluation is the inaccurate noise analysis. Evaluations by SANDAG refute the ambient freeway noise levels presented by Gordon Bricken & Associates when measured at the closest residential point to the splashdown ride (4371 Loma Riviera Court, 92110)
- (3) The air pollution monitoring station cited in the E.I.R. of 6/5/2001 is located South East of the convention center and it's air quality data in no way relates to the I-5/I-8 intersection area adjacent to SeaWorld. The West bound traffic that uses I-8 Ingraham exit to SeaWorld was ignored. Both instances when pointed out to the city were fraudulently ignored by city hall staff.

Beyond all of the above is the fact that when the re-siting of the Splashdown ride took place (moving it from the June 2001 E.I.R. location in the Northeasterly corner of the park to the area immediately East of the entrance) there was no new E.I.R report prepared and circulated to the public and/or public oversight bodies adjoining SeaWorld. Such as the Peninsula Community Planning Board and The Loma Riviera Community Association Board of Directors.

The Summary of Staff Recommendation is completely without merit when measured by the intent of the standards set forth in the grounds for revocation of permit parts (a) and (b). The clear and foremost duty of this commission is to protect the general public from the obvious intent of SeaWorld to obscure the facts through it's contractors and financial influence on the staff at the city hall of San Diego.

As intentially erroneous information was presented to the coastal commission by the SeaWorld advocates this obviously resulted in an erroneous decision to approve the Splashdown in it's original location. The failure to observe the proper evaluative procedures for relocating it to a more noise objectionable location (closer proximity to Point Loma homeowners) is sufficient in itself to revoke the SeaWorld permit.

Sincerely yours,



R. Jarvis Ross  
Peninsula Community Planning Board Member

Sing.

RECEIVED

SEP 09 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

01/2003

SES 459  
7364

NO To See Would

Splashdown with

Enough is Enough

Been for teenagers is  
Wrong.

Nearby community heavily  
impacted with traffic/noise

gauge at a  
assessment Park

No



No

Nike Drill

9/6/2003

RECEIVED

SEP 04 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT



CONVENTION &  
VISITORS BUREAU

September 4, 2003

401 B STREET SUITE 1400

SAN DIEGO, CA 92101-4237

Chairman Reilly and  
Members of the California Coastal Commission  
San Diego Area  
7575 Metropolitan Drive, Suite 101  
San Diego, CA 92108

(619) 232-3101 TEL

(619) 696-9371 FAX

WWW.SANDIEGO.ORG

RE: Petition for Revocation of Coastal Development Permit No. 6-01-129:  
SeaWorld Adventure Park Splashdown Ride

Dear Chairman Reilly and Members of the California Coastal Commission:

It is my understanding that you have been petitioned on behalf of California Earth Corps to revoke the coastal development permit for SeaWorld's splashdown ride and we respectfully urge you to reject this petition.

SeaWorld diligently participated in the Coastal Commission permitting process. They provided the Commission with all relevant documents, reports and studies regarding the Mission Bay landfill, sensitive habitat and endangered species. Furthermore, California Earth Corps had ample opportunity to fully participate in the original Master Plan and permit proceedings at various hearings at both the City Council and Coastal Commission levels.

The California Coastal Commission approved SeaWorld's Master Plan on February 7, 2002. The Splashdown ride and accompanying documentation was part of that approved Master Plan. Prior to being approved by the Coastal Commission, SeaWorld's Master Plan was approved by the San Diego City Council, the San Diego Planning Commission, the Park and Recreation Board, the Mission Bay Park

THE OFFICIAL TRAVEL  
RESOURCE FOR THE  
SAN DIEGO REGION

EXHIBIT NO. 7  
APPLICATION NO.  
**6-01-129**  
Letters Opposing  
Revocation

California Coastal Commission

Page 2

September 4, 2003

Committee, and the Design and Review Committee of Park and Recreation. This plan was carefully designed to balance economic, recreational and environmental concerns. As you may know, dozens of public forums were held and SeaWorld responded by amending the plan to reflect the needs of residents, visitors, environmental organizations, the tourism industry and the business community.

The Commission's decision to grant the coastal development permit for the Splashdown ride is consistent with the Mission Bay Park Master Plan and the Coastal Act. When the Coastal Commission certified the SeaWorld Master Plan the landfill was a major point of discussion. Several public speakers discussed the issue. The Coastal Commission also received the Master Plan environmental impact report that thoroughly discussed the landfill and noted that it has been the subject of several prior studies. This landfill is well known and well documented. All the regulatory bodies (EPA, RWQCB, DTSC, EHD and APCD) have been involved in the monitoring and regulating of this landfill. Every regulatory body has concluded that the Master Plan development, including the Splashdown ride, would not be negatively affected by the landfill. Certainly the fact that SeaWorld and its patrons have occupied the property adjacent to the landfill for almost 40 years without incident evidences the environmental safety of the site.

After nearly four years of governmental processing, SeaWorld recently began construction on their Splashdown ride project and expended millions of dollars in reliance on the permit issued by the Coastal Commission. This petition to revoke their permit is simply without merit. All landfill, sensitive habitat and endangered species issues related to all SeaWorld development have been discussed publicly at hearings and in various documents. I respectfully request that you deny this petition to revoke SeaWorld's development permit and allow construction to proceed so SeaWorld can continue to be the world's premier marine zoological park and remain one of San Diego's top tourist attractions. Thank you.

Sincerely,



Reint Reinders, CHA  
President & CEO



**SAN DIEGO  
REGIONAL  
CHAMBER OF  
COMMERCE**

**RECEIVED**

SEP 08 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

**EMERALD PLAZA**  
402 West Broadway, Suite 1000  
San Diego, California 92101-3585  
Tel 619.544.1300

[www.sdchamber.org](http://www.sdchamber.org)

September 5, 2003

Mr. Mike Reilly, Chairman, and  
Members of the California Coastal Commission  
San Diego Area  
7575 Metropolitan Dr. Suite 103  
San Diego, CA 92108

RE: Petition for Revocation of Coastal Development Permit No. 6-01-129:  
SeaWorld Adventure Park Splashdown Ride

Dear Chairman Reilly and Members of the California Coastal Commission:

You have been petitioned on behalf of California Earth Corps to revoke the coastal development permit for SeaWorld's splashdown ride. On behalf of the San Diego Regional Chamber of Commerce, I respectfully urge you to reject this petition.

SeaWorld diligently participated in the Coastal Commission permitting process. They provided the Commission with all relevant documents, reports and studies regarding the Mission Bay landfill, sensitive habitat and endangered species. Furthermore, California Earth Corps had ample opportunity to fully participate in the original Master Plan and permit proceedings at various hearings at both the City Council and Coastal Commission levels.

The California Coastal Commission approved SeaWorld's Master Plan on February 7, 2002. The Splashdown ride and accompanying documentation was part of that approved Master Plan. Prior to being approved by the Coastal Commission, SeaWorld's Master Plan was approved by the San Diego City Council, the San Diego Planning Commission, the Park and Recreation Board, the Mission Bay Park Committee, and the Design and Review Committee of Park and Recreation. This plan was carefully designed to balance economic, recreational and environmental concerns. Dozens of public forums were held and SeaWorld responded by amending the plan to reflect the needs of residents, visitors, environmental organizations, the tourism industry and the business community.

The Commission's decision to grant the coastal development permit for the Splashdown ride is consistent with the Mission Bay Park Master Plan and the Coastal Act. When the Coastal Commission certified the SeaWorld Master Plan, the landfill was a major point of discussion.

Mr. Mike Reilly, Chairman, and  
Members of the California Coastal Commission  
September 5, 2003  
Page 2

Several public speakers discussed the issue. The Coastal Commission also received the Master Plan environmental impact report that thoroughly discussed the landfill and noted that it has been the subject of several prior studies. This landfill is well known and well documented. All the regulatory bodies (EPA, RWQCB, DTSC, EHD and APCD) have been involved in the monitoring and regulating of this landfill. Every regulatory body has concluded that the Master Plan development, including the Splashdown ride, would not be negatively affected by the landfill. Certainly the fact that SeaWorld and its patrons have occupied the property adjacent to the landfill for almost 40 years without incident evidences the environmental safety of the site.

After nearly four years of governmental processing, SeaWorld recently began construction on their Splashdown ride project and expended millions of dollars in reliance on the permit issued by the Coastal Commission. This petition to revoke their permit is simply without merit. All landfill, sensitive habitat and endangered species issues related to all SeaWorld development have been discussed publicly at hearings and in various documents. I respectfully request that you deny this petition to revoke SeaWorld's development permit and allow construction to proceed so SeaWorld can continue to be the world's premier marine zoological park and remain one of San Diego's top tourist attractions. Thank you.

Sincerely,

A handwritten signature in cursive script, reading "Eugene Mitchell".

Eugene Mitchell  
Vice President,  
Public Policy & Communications

EM:av





RECEIVED

SEP 05 2003

**DICK MURPHY**  
MAYOR

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

September 3, 2003

Commissioner Mike Reilly, Chairman, and  
Members of the California Coastal Commission  
7575 Metropolitan Dr. Suite 101  
San Diego, CA 92108

RE: Petition for Revocation of Coastal Development Permit No. 6-01-129:  
SeaWorld Adventure Park Splashdown Ride

Dear Chairman Reilly and Members of the California Coastal Commission:

You have been petitioned on behalf of California Earth Corps to revoke the coastal development permit for SeaWorld's splashdown ride and I respectfully urge you to reject this petition.

The California Coastal Commission approved SeaWorld's Master Plan on February 7, 2002. The Splashdown ride and accompanying documentation was part of that approved Master Plan. Prior to being approved by the Coastal Commission, SeaWorld's Master Plan was approved by the San Diego City Council, the San Diego Planning Commission, the Park and Recreation Board, the Mission Bay Park Committee, and the Design and Review Committee of Park and Recreation. This plan was carefully designed to balance economic, recreational and environmental concerns. Dozens of public forums were held and SeaWorld responded by amending the plan to reflect the needs of residents, visitors, environmental organizations, the tourism industry and the business community.

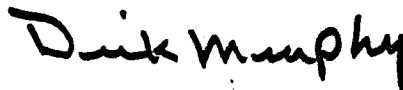
The Commission's decision to grant the coastal development permit for the Splashdown ride is consistent with the Mission Bay Park Master Plan and the Coastal Act. When the Coastal Commission certified the SeaWorld Master Plan, the landfill was a major point of discussion. Several public speakers discussed the issue. The Coastal Commission also received the Master Plan environmental impact report that thoroughly discussed the landfill and noted that it has been the subject of several prior studies.

Commissioner Mike Reilly and  
Members of the California Coastal Commission  
September 3, 2003  
Page 2

After nearly four years of governmental processing, SeaWorld recently began construction on their Splashdown ride project and expended millions of dollars in reliance on the permit issued by the Coastal Commission.

I respectfully request that you deny this petition to revoke SeaWorld's development permit and allow construction to proceed, so SeaWorld can continue to be the world's premier marine zoological park and remain one of San Diego's top tourist attractions. Thank you.

Sincerely,



Dick Murphy  
Mayor  
City of San Diego

DM/ts/rb

Cc: Peter Douglas, California Coastal Commission  
Chuck Damm, California Coastal Commission  
Deborah Lee, California Coastal Commission

STATE CAPITOL, ROOM 5050  
SACRAMENTO, CA 95814-4900  
TEL (916) 445-3952  
FAX (916) 327-2188

DISTRICT OFFICE  
1557 COLUMBIA STREET  
SAN DIEGO, CA 92101-2934  
TEL (619) 645-3090  
FAX (619) 645-3094

SENATOR.ALPERT@SEN.CA.GOV

# California State Senate

SENATOR  
DEDE ALPERT

THIRTY-NINTH SENATORIAL DISTRICT  
CHAIR

SENATE APPROPRIATIONS COMMITTEE

COMMITTEES  
CHAIR, APPROPRIATIONS  
AGRICULTURE AND  
WATER RESOURCES  
EDUCATION  
NATURAL RESOURCES AND  
WILDLIFE  
REVENUE AND TAXATION

SELECT COMMITTEES  
CHAIR, FAMILY, CHILD AND  
YOUTH DEVELOPMENT

JOINT COMMITTEES  
CHAIR, MASTER PLAN FOR  
EDUCATION  
VICE CHAIR, FISHERIES AND  
AQUACULTURE

RECEIVED

SEP 08 2003

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT



September 5, 2003



Chairman Reilly and Members of the California Coastal Commission  
San Diego Area  
7575 Metropolitan Dr. Suite 101  
San Diego, CA 92108

RE: Petition for Revocation of Coastal Development Permit No. 6-01-129:  
SeaWorld Adventure Park Splashdown Ride

Dear Chairman Reilly and Members of the California Coastal Commission:

I understand you have been petitioned on behalf of California Earth Corps to revoke the coastal development permit for SeaWorld's splashdown ride. I respectfully urge you to reject this petition.

SeaWorld appropriately participated in the Coastal Commission permitting process. It provided the Commission with sufficient documents, reports and studies regarding the Mission Bay landfill, sensitive habitat and endangered species for the Commission to render an informed decision. Furthermore, interested groups had every opportunity to fully participate in the original Master Plan and permit proceedings at various hearings at both the City Council and Coastal Commission levels.

The California Coastal Commission approved SeaWorld's Master Plan on February 7, 2002, a hearing I attended in support of approval. The Splashdown ride and accompanying documentation was part of that approved Master Plan. Prior to being approved by the Coastal Commission, SeaWorld's Master Plan was approved by the San Diego City Council, the San Diego Planning Commission, the Park and Recreation Board, the Mission Bay Park Committee, and the Design and Review Committee of Park and Recreation.

After nearly four years of governmental processing, SeaWorld recently began construction on their Splashdown ride project and expended millions of dollars in good faith in reliance on the permit issued by the Coastal Commission. This petition to revoke their permit is simply without merit. I respectfully request that you deny this petition to revoke SeaWorld's development permit and allow construction to proceed so SeaWorld can continue to be the world's premier marine zoological park and remain one of San Diego's top tourist attractions. Thank you for your time and consideration of this letter.

Sincerely,

A handwritten signature in cursive script that reads "Dede Alpert".

SENATOR DEDE ALPERT  
39th District

LETTER OPPOSING  
REVOCATION

DA:jj

## CALIFORNIA COASTAL COMMISSION

SAN DIEGO AREA  
7575 METROPOLITAN DRIVE, SUITE 103  
SAN DIEGO, CA 92108-4402  
(619) 767-2370

**Mon 9a**

SEE SUBSEQUENT PAGE 14  
FOR COMMISSION ACTION

Filed: May 10, 2002  
49th Day: June 28, 2002  
180th Day: November 6, 2002  
Staff: EL-SD  
Staff Report: August 19, 2002  
Hearing Date: September 9-13, 2002

REGULAR CALENDAR  
STAFF REPORT AND PRELIMINARY RECOMMENDATION

Application No.: 6-01-129

Applicant: SeaWorld Adventure Park

Agent: Patrick Owen

Description: Construction of a splash down water ride, consisting of three towers (95, 89 and 83 feet high), interior and exterior sets with water effects, a 130,000 gallon exhibit tank for up to ten Commerson Dolphins, a gift shop, snack stand, restrooms, and several accessory structures, located on approximately 5.5 acres along and within the southern border of the enclosed theme park, east of the visitor entrance and adjacent to the main parking lot.

Site: 500 SeaWorld Drive, Mission Bay Park, San Diego, San Diego County.  
APN 760-037-01

Substantive File Documents: Certified Mission Bay Park Precise Plan; SeaWorld Master Plan Update; Rollercoaster Noise Surveys, dated 4/23/01; Final EIR for SeaWorld Master Plan Update, dated 5/31/2001

STAFF NOTES:

Summary of Staff's Preliminary Recommendation: This application was originally scheduled on the Commission's July 9, 2002 meeting agenda. However, a different SeaWorld matter was scheduled for City of San Diego City Council action the same day, and the applicant requested this matter be postponed to avoid a conflict. Staff is recommending approval with conditions which address visual resource and public access concerns. Specifically, the conditions require submittal of final plans, including landscaping plans, identify appropriate staging areas and construction windows, and restrict the color of those portions of the ride visible from outside SeaWorld.

I. PRELIMINARY STAFF RECOMMENDATION:

The staff recommends the Commission adopt the following resolution:

EXHIBIT NO. 8  
APPLICATION NO.  
**6-01-129**  
Original Staff Report

**MOTION:**     *I move that the Commission approve Coastal Development Permit No. 6-01-129 pursuant to the staff recommendation.*

**STAFF RECOMMENDATION OF APPROVAL:**

Staff recommends a YES vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

**RESOLUTION TO APPROVE THE PERMIT:**

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

**II. Standard Conditions.**

See attached page.

**III. Special Conditions.**

The permit is subject to the following conditions:

1. **Final Plans.** PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicants shall submit to the Executive Director for review and written approval, final site plans, building plans and elevations approved by the City of San Diego, which shall clearly delineate the ride in its approved location, and otherwise be in substantial conformance with the preliminary plans submitted by the applicant, titled "2003 Expansion, SeaWorld San Diego," dated August 10, 2001

The permittees shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without an amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

2. Revised Landscaping Plan. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit a detailed landscape plan for the long-term plantings that indicates the type, size, extent and location of all plant materials, the proposed irrigation system and other landscape features. Said plan shall be in substantial conformance with the Planting Plan (sheet L1.2) dated 8/10/01, except as revised below, and shall be submitted to the Executive Director for review and written approval and include the following:

- (a) Only drought tolerant native plant materials shall be utilized.
- (b) Trees shall reach at least 60 feet at maturity.
- (c) Existing mature vegetation along the theme park's eastern and southern perimeters shall be retained and maintained in good growing condition.

The permittees shall undertake development in accordance with the approved final landscaping plan. Any proposed changes to the approved landscaping plans shall be reported to the Executive Director. No changes to the approved landscaping plans shall occur without an amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

3. Construction Access/Staging Area/Project Timing. PRIOR TO THE ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit plans showing all locations which will be used as staging and storage areas for materials and equipment during the construction phase of this project. The staging/storage plan shall be subject to review and written approval of the Executive Director. Use of public walkways and public parking areas, including on-street parking for the interim storage of materials and equipment shall not be permitted. If areas outside the leasehold are designated as staging/storage areas, or if construction will require any restrictions on traffic along Sea World Drive (such as lane closures), the plan shall also indicate that no work may occur during the summer months (Memorial Day weekend to Labor Day) of any year.

4. Coloration of Structure. To minimize visibility from outside SeaWorld, those portions of the approved splash down ride visible from outside SeaWorld shall not be finished in any solid white or bright color.

#### IV. Findings and Declarations.

The Commission finds and declares as follows:

1. Detailed Project Description. The applicant, SeaWorld, is proposing to add a new attraction to the existing theme park. This would consist of a splash down water ride themed as the Lost City of Atlantis, which is proposed as a multi-structure, and multi-level, complex. The proposed primary structures include one building with three towers (83, 89 and 95 feet in height), interior and exterior sets with water effects, and a 130,000

gallon exhibit tank for up to ten Commerson Dolphins. Proposed accessory structures include a gift shop, snack stand, restrooms, and various operation and maintenance structures. The proposed ride would be located on approximately 5.5 acres along and within the southern border of the enclosed theme park, east of the visitor entrance and adjacent to the main parking lot.

This is the first application for development under the new SeaWorld Master Plan Update, which the Commission voted to certify in February, 2002. The new master plan addresses build-out of SeaWorld over the next 15-20 years, and is divided into Tier 1, Tier 2 and Special Projects. The splash down ride is a Tier 1 project, and has been described in detail in the master plan. An EIR was prepared, circulated for public review and approved by the City of San Diego for the master plan, which looked at the overall plan but also analyzed potential impacts and mitigation requirements for the identified Tier 1 projects. The issues addressed with regard to the splash down ride are visual resources, public access, and water quality.

SeaWorld is located within Mission Bay Park in the City of San Diego. It is situated adjacent to Mission Bay and is surrounded largely by City parklands consisting of grassy, open areas. Mission Bay Park is an area of deferred certification, where the Commission retains jurisdiction and Chapter 3 policies of the Coastal Act are the standard of review, with the certified master plan used as guidance.

2. Visual Impacts. Section 30251 of the Coastal Act addresses visual resources, and states, in part:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas....

Mission Bay Park is recognized nationally as a public resource providing a wide variety of passive and active recreational opportunities in a unique, visually-pleasing setting of rolling grassy areas, sandy beach and open water. Commercial leaseholds, including SeaWorld, are scattered throughout the park and include high-rise structures at four hotel sites, as well as the observation tower and gondola ride at SeaWorld. These few structures all predate the Coastal Act and the City's coastal zone height initiative which established a limit of 30 feet. No permanent structural improvements exceeding 30 feet in height have been approved anywhere in Mission Bay Park since passage of the Coastal Act and the City height initiative.

In 1998, SeaWorld secured passage of a new height initiative, exempting itself from the 30-foot limit. Following this, SeaWorld developed a detailed master plan that established development sites and design criteria for future buildout of the park, and redevelopment of existing areas. The initiative made it clear that heights exceeding the 30-foot limit

could be proposed within the SeaWorld leasehold, but the City Council and Coastal Commission would decide whether or not to approve the specific proposals. The currently developed portions of SeaWorld are heavily landscaped with a variety of mature trees, shrubs and groundcovers. Many existing trees are 60-80 feet tall and effectively screen the interior of the park from views from outside SeaWorld. In addition, the existing landforms and development in this area obscure any view of Mission Bay across the historic leasehold itself. Therefore, some taller elements in this area may be found consistent with Section 30251, depending on their exact location and design.

The appropriate height of any proposed structure must be thoroughly analyzed, taking into consideration the specific design details, siting, scale and bulk of the proposed development, the nature of surrounding development, and the potential for cumulative impacts from additional future development. The master plan, as modified by the Commission, identified a specific site for the proposed splash down ride within the developed area of the park close by the main parking lot. The proposed project site is the one the Commission approved in the master plan.

All of Mission Bay Park is a highly scenic public recreational resource, such that protection and enhancement of visual amenities is a critical concern in any proposed development in the park. The proposed ride is located within, but along the perimeter of, the existing enclosed Sea World theme park, adjacent to the main parking lot, but separated from it by a fence and existing landscaping. As the proposed ride is of the roller coaster variety, much of it will be higher than 30 feet, the typical height limit for the City of San Diego's coastal zone. It will occupy most of the delineated 5.5 acre site, but is not fully enclosed. Therefore, there will still be some views through/across the specific site, although such views are limited to persons already in the theme park. There is no existing bay view in this location.

Several separate structures are proposed to house the various elements of the ride and accessory facilities. The one proposed structure exceeding 30 feet in height houses the three ride towers necessary to create the ride experience: a lift tower, a drop tower and a stair tower, connected to each other by segments of track and portions of the building. The three towers are 95, 83 and 89 feet tall respectively, with approximate diameters of 50 feet, 36 feet and 24 feet. Due to the existing mature vegetation throughout much of the developed park, existing buildings 30 feet or less in height cannot be readily seen from outside the park.

The proposed structures which exceed 30 feet will be visible from some vantage points within and outside the SeaWorld leasehold; however, the Commission's primary concern with respect to view preservation, is to assure that views currently available to the general public recreating at Mission Bay Park are not obscured or significantly degraded. The public recreational amenities at South Shores Park are located immediately east of the SeaWorld leasehold, but approximately 2,000 feet distant from the proposed ride location. Across Pacific Passage to the north lies Fiesta Island. Along with South Shores, this is the last remaining large piece of undeveloped parkland designated for



public recreational uses. Like South Shores, anticipated improvements include grassy picnic areas, open play areas, restrooms and parking lots. These two areas are the closest to the SeaWorld leasehold, and thus most likely to be affected by development within the theme park.

The applicant has submitted computer generated pictures (see Exhibit A) to show the views from a number of locations, including South Shores and Fiesta Island. From both locations, the splash down ride will be visible; however, in its proposed location, there is a significant amount of intervening development, mature vegetation, and space to soften the views to the point where the structures will not be a domineering or prominent presence. Due to the roadside berm, which is densely vegetated to screen the parking lots, and the considerable distance across the parking lots (approximately 800-900 feet), the ride will not be readily discernable from Sea World Drive, based on the computer simulation. A couple photos were taken from more distant areas within Mission Bay Park. These demonstrate that the ride will appear as only a background object from both vantage points, as well as from more distant areas such as I-5, I-8, and the Presidio.

The applicant has submitted a conceptual landscaping plan for the splashdown ride site. This plan meets the specific design criteria identified in the certified SeaWorld Master Plan Update for this facility, which includes screening vegetation (trees) that will attain 60 feet in height at maturity. However, some of the species chosen are not native plants. Special Condition #2 requires submittal of a final, revised landscaping plan, requiring use of only drought-tolerant native vegetation and that selected species must meet the same height and screening criteria as contained in the Master Plan Update. Additionally, the condition requires retention and maintenance of all the existing mature trees/landscaping which provide a visual screen of the proposed ride structure from views from the land and water areas of Mission Bay Park and the surrounding communities.

In summary, the applicant is proposing the splash down ride in an appropriate location, consistent with the SeaWorld Master Plan that the Commission voted to certify. It's visibility from outside SeaWorld will be primarily limited to the three towers, it will be quite distant from public viewing areas, and it will blend in with surrounding mature vegetation. As proposed, the structures are colored in various hues of beige, terra cotta, green and blue. Special Condition #4 provides that the portions of the attraction visible from outside SeaWorld not be finished in any white or bright solid color. Special Condition #2 requires submittal of a final landscaping plan, requiring use of only drought-tolerant native vegetation which provides effective screening of the structures. Therefore, as conditioned, the Commission finds the proposed new attraction will be consistent with Section 30251 of the Act.

3. Public Access/Parking. The following Coastal Act policies are most pertinent to the proposed development, and state, in part:

Section 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212

(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where:

(1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources,

(2) adequate access exists nearby.

Section 30604(c)

(c) Every coastal development permit issued for any development between the nearest public road and the sea or the shoreline of any body of water located within the coastal zone shall include a specific finding that the development is in conformity with the public access and public recreation policies of Chapter 3 (commencing with Section 30200).

Section 30252

The location and amount of new development should maintain and enhance public access to the coast by...(4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, [and] (5) assuring the potential for public transit for high intensity uses....

SeaWorld is a private commercial leasehold within Mission Bay Park, a public park built primarily on tidelands granted to the City of San Diego. The site is located between the first coastal roadway and the bay. Although public lateral access is available along most of the Mission Bay shoreline, there is no public access through the fenced SeaWorld facilities, which extend to or beyond the waterline in places. Pedestrian and bicycle traffic can cross through the parking areas and rejoin the bayside pathway on either side of the leasehold. Vertical access to the shoreline is available both east and west of the Sea World leasehold.

The certified Mission Bay Park Master Plan cites a complete pedestrian access pathway around the bay as a future goal. In its recent action to certify the SeaWorld Master Plan, the Commission determined that additional pedestrian or bicycle access through the SeaWorld leasehold was not required to mitigate for the detailed Tier 1 projects identified in the plan, although additional access may be required for some or all of the Tier 2 projects in the future, as these are only identified as potential redevelopment sites. The

proposed splash down ride is one of the five Tier 1 projects proposed in the SeaWorld Master Plan as approved by the City and the Coastal Commission.

The Master Plan requires the widening and improvement of the existing bicycle/pedestrian path which currently runs around the inland perimeter of the SeaWorld leasehold. As approved by the City Council, the plan requires widening the existing 10-foot wide paved pathway, which follows SeaWorld Drive and Perez Cove Way for the most part, to 17 feet of path with a four to ten-foot landscape strip separating bicycle and foot traffic wherever possible. This would bring the path into compliance with current Mission Bay Park standards. In addition, the plan requires clear and adequate signage identifying the path as a public amenity.

Another public access benefit gained through the City's approval of the Master Plan is the off-site improvement of some of the missing segments of the existing shoreline access path around Mission Bay. These improvements total approximately 4,700 linear feet of 10-foot wide pathway, located between SeaWorld and the Fiesta Island causeway, where the current path is discontinuous in places. As approved by the City, this improvement is required to be in place by the end of 2002.

In its review of the SeaWorld Master Plan Update, the Commission expressed concerns regarding the direct loss of public parkland, failure to provide adequate shoreline setbacks for public access and the need to prioritize public recreational improvements over commercial development and leasehold expansion within Mission Bay Park. The Commission suggested changes to the plan policies to address implementation measures and funding mechanisms to assure completion of identified regional park improvements on South Shores and Fiesta Island concurrent with expansion of the SeaWorld leasehold or any other expanded commercial development in Mission Bay Park. Such private commercial development has a cumulative impact on traffic and circulation within the park and occupies land area otherwise available for lower cost visitor and recreational facilities which are high priority uses under the Coastal Act.

The Commission's suggested modification to the policy language indicates that completion of the planned public improvements within South Shores and Fiesta Island must be given a higher priority. The intent of the suggested language is to assure that significant commercial development in Mission Bay Park only proceeds commensurate with equitable public improvements identified in the plan.

With regard to the SeaWorld leasehold, the Commission's suggested modifications relating to provision of public recreational improvements would affect any development proposed on the 16.5 acre expansion area, i.e. the Special Event Center and the parking above the 10 acre landfill. The suggested modifications include a public access improvement, the waterfront promenade on South Shores Park which, if constructed by SeaWorld, would serve to offset in part the ongoing access constraints on lower cost visitor and recreational facilities in Mission Bay Park, which will be exacerbated by the proposed Tier 1 projects, and would allow all Tier 1 development to move forward.

There is an existing asphalt path from SeaWorld to the Fiesta Island Causeway, utilized by both bikers and pedestrians, which already provides access inland from the water's edge. Support facilities such as landscaping, shade structures, picnic tables, benches, trash cans, etc. are the type of public improvements lacking in the area.

The Commission found completion of the waterfront promenade would be an important first step by the City and SeaWorld toward completion of South Shores Park. The Commission found construction of the waterfront promenade will offset the impacts to public access associated with expansion of the SeaWorld leasehold in an area otherwise available to provide lower cost visitor and recreational facilities and will assure completion of a significant component of the planned South Shores park development commensurate with Tier 1 expansion plans.

Therefore, the Commission found these modifications are the minimum necessary to respond to known public needs, especially the need for additional low-cost public improvements. Areas of Mission Bay Park, in particular South Shores and Fiesta Island, are currently underutilized because they lack basic infrastructure, such as electricity, water, and sewer improvements, as well as conveniences like restrooms, picnic tables, benches, etc. As other Tier 1 developments within the 16 acre expansion area come forward, assurance of completion of these South Shore public improvements should accompany requests for coastal development permits. The applicant has indicated it is currently preparing a permit application for the Tier 1 access improvements and it should be coming before the Commission this fall. The other Tier 1 projects, which were all conceptually endorsed in the master plan, include educational facilities, front gate renovations and an enlarged and relocated special events center.

In conclusion, the proposed ride will have no effect on current public access patterns in this part of Mission Bay Park, since it is located within the already developed and enclosed portion of SeaWorld. Although the location originally proposed location in the master plan, which was along the perimeter of the bay, raised concerns that ride noise would affect the recreational experience of persons in nearby public park areas, the currently proposed site is within the already developed portion of the park, much further removed from public park areas. The Commission finds that construction and operation of the proposed splash down ride will not diminish any existing access opportunities or recreational experiences, and adequate lateral and vertical access is available to serve the demonstrated needs of the public in this area of Mission Bay Park, as specifically required in Section 30604(c) of the Coastal Act.

Another issue of great concern to the Commission is the traffic circulation problem, which currently exists in the area and is anticipated to worsen with future growth. Sea World Drive and Ingraham Street serve as major coastal access routes for all areas of Mission Bay Park, and the public beaches at Pacific Beach, Mission Beach and Ocean Beach, and serve as a popular commuter route as well. These are the only roadways serving SeaWorld. The proposed Mission Bay Park Master Plan amendments and SeaWorld Master Plan Update include a number of good policies on traffic issues, and include a range of mitigation measures to be implemented in the future based on overall growth and attendance counts at SeaWorld. In its review of these plan amendments, the

Commission found the major problem is not determining what improvements are needed, but prioritizing the improvements according to greatest need, and finding a means to fund and implement necessary improvements.

With respect to the proposed Tier 1 improvements, the necessary traffic improvements at the I-5/SeaWorld Drive Interchange and the I-8/I-5 Interchange are not triggered by these improvements, but are tied to the results of the Mitigation, Monitoring and Reporting Program required by the EIR for the SeaWorld Master Plan Update. The Caltrans Project Study Report will identify the phasing and funding of traffic improvements necessary to relieve congestion during peak summer recreational use and address the cumulative effects of increased population, commercial development and public recreational demand. Thus, the Commission supported the expenditure of the first mitigation monies toward completion of the Caltrans Project Study Report. It is SeaWorld's proposed Tier 2 development that may potentially be delayed if traffic mitigation is not guaranteed due to the status of Caltrans studies and project funding. This conclusion was drawn from the findings of the EIR for the SeaWorld Master Plan Update.

That EIR identifies traffic impacts and recommended mitigation for 2005 and 2020, but indicates the measures should not be tied to a specific year but, instead, SeaWorld should implement a Mitigation, Monitoring and Reporting Program (MMRP) to identify when the impacts occur, due to the uncertainty of SeaWorld attendance. The EIR indicates there are significant impacts to the SeaWorld Drive and I-5 interchange for 2005 and 2020 that are considered unmitigated if full funding for the CIP is delayed or never achieved. SeaWorld's monetary obligation to the CIP is tied to the MMRP. According to the EIR, when SeaWorld's project traffic exceeds the identified thresholds in the MMRP, SeaWorld will be responsible for its fair share contribution.

The Commission found the EIR analysis suggests there is a potential for significant impacts to occur from SeaWorld and any commercial expansion within Mission Bay Park without the assurance that adequate traffic mitigation measures will ever occur. This uncertainty is not acceptable within a regional and statewide visitor destination center such as Mission Bay Park, or consistent with Sections 30210 and 30250 of the Coastal Act. Therefore, the Commission suggested changes to the plan policies to address traffic matters in an attempt to help promote faster implementation of traffic improvements. They address needed freeway improvements, identify some potential funding mechanisms and require that the Caltrans Project Study Reports for I-5/I-8 improvements and at the I-5/SeaWorld Drive Interchange be utilized as a factor in determining when expansion of commercial development and/or leaseholds may occur within Mission Bay Park in the future. These reports are necessary to determine the phasing and funding of improvements necessary to relieve congestion during peak summer recreational use and address the cumulative effects of increased commercial development, population and public recreational demand.

The revision to the SeaWorld Master Plan Update, as proposed by SeaWorld and the City, establishes the exact amount of SeaWorld's share of traffic improvement monies, to be paid in five annual installments. The Commission augmented this revision to require

the first annual payment to be paid upon effective certification of the subject LCP amendment. It also added provisions for either a 3% annual increase, or an increase based on the Consumer Price Index, whichever is greater, to address increases in costs over the five-year payment period. The Commission found the City's and SeaWorld's proposal to pay traffic mitigation funds sooner than required by the EIR will expedite completion of the Project Study Report and the identification and phasing of the necessary traffic mitigations. The information in the Project Study Report will be utilized in determining traffic mitigation requirements associated with future development within Mission Bay Park. The Commission found such plan policies are necessary in order to prevent traffic congestion related to future development at SeaWorld and other portions of Mission Bay Park from impeding the public's ability to get access to the coast, pursuant to Sections 30250 and 30252 of the Coastal Act.

With respect to the adequacy of on-site parking, SeaWorld currently provides a total of 8,350 parking spaces for visitors, staff, and employees; parking spaces have not been specifically allocated for individual uses, but most employee parking occurs in the lots nearest the administrative facilities and, during times of heaviest park use, in the parking lot nearest the Hubbs Research laboratories, aquaculture tanks, and associated research and administrative functions, located northwest of SeaWorld proper, but within the overall leasehold boundaries. Although it is difficult to accurately analyze exactly how much parking a theme park such as Sea World normally requires, there is no indication that on-site parking facilities are currently inadequate.

In addition to on-site parking accommodation and fairly recent circulation improvements, Sea World is served by two public transit (bus) routes, #9 and #27. The Master Plan Update which the Commission recently voted to certify requires SeaWorld to provide financial incentives for visitors to take public transportation to SeaWorld. The Commission suggested policy revisions which discuss the promotion of public transportation as a way to reduce traffic volumes on the street system. Included is an offer by SeaWorld to reduce the price of admission by \$5.00 to anyone showing proof of use of transit. The Plan Update identifies a number of other potential incentives, some already implemented and others to be implemented based on need. These include tram service for summertime weekends to transport people from the nearby trolley stations to SeaWorld, and additional financial incentives which might increase use of public transportation (buses and trolleys). Implementing a tram would encourage better ridership by recreational users. Other incentives suggested by SeaWorld are programs encouraging employee use of public transportation and advertising the availability of transit services in advertising brochures. The success of the above-mentioned range of incentives to encourage public transit will be evaluated in review of future development proposals within the SeaWorld leasehold to determine whether additional measures are warranted to assure compliance with the requirements of Section 30252 of the Coastal Act to facilitate the provision of transit service, especially for high intensity uses such as SeaWorld.

In summary, the Commission finds that adequate vertical and lateral access exists around the Sea World leasehold for the currently demonstrated needs of visitors to this portion of



Mission Bay Park. In addition, the on-site parking reservoir continues to be adequate for the facilities needs to date even with the proposed ride attraction and other Tier 1 projects. Special Condition #3 requires identification of all construction staging and storage areas, prohibiting the use of public areas for this purpose. If use of public areas or closure of travel lanes cannot be avoided altogether, then work must occur outside the summer season. Therefore, as conditioned, the Commission finds the proposal consistent with all of the cited public access policies of the Coastal Act.

3. Water Quality. The following Coastal Act policies addressing water quality are most applicable to the subject proposal, and state, in part:

Section 30230

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

Section 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum population of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff ...

Over the years, concerns have been raised regarding SeaWorld's land and water operations with respect to maintaining optimum water quality. In particular, the manner in which surface runoff from the parking lots is discharged has been raised as a significant issue. This issue was addressed in detail in review of the master plan, and SeaWorld's grading, drainage, erosion and stormwater requirements were reviewed and found acceptable by the Commission's water quality unit. The proposed project is identified and fully described in the master plan, and is designed to be a part of the existing stormwater improvements. Moreover, the proposed splash down ride will not increase impermeable surfaces or significantly change existing patterns of runoff. In fact, since the specific project site is fully paved at this time, there will be a net decrease in impermeable surfaces as a result of this project, which includes the removal of some paving and replacement with landscape features. The subject proposal does not modify any of SeaWorld's existing water treatment, collection or discharge facilities. These facilities currently process runoff from some of SeaWorld's paved parking lots and nearly all of its developed venues; this treatment will continue. Therefore, as conditioned to address other concerns, the Commission finds the proposed development consistent with the cited policies of the Coastal Act.

4. Noise/Marine Mammals. Section 30230 of the Coastal Act, cited in the previous finding, protects marine resources and is the most applicable Coastal Act policy with regard to marine mammals that are held in captivity at SeaWorld. At the Commission hearing for the SeaWorld Master Plan, a number of citizens and Commissioners raised concerns over how the captive marine mammals at SeaWorld would be affected by noise generated by the ride. Of particular concern are the Commerson's Dolphins, which are proposed to be exhibited within the overall project site. The applicant has submitted a study of roller coaster noise conducted at two other Busch facilities (Orlando and Tampa), which indicates that proper design will assure that noise will not exceed current ambient levels experienced by the dolphins in their existing exhibit tank. Exhibit #1 is the two-page summary of that report and includes specific design recommendations which have been incorporated into the project plans.

5. Local Coastal Planning. Section 30604(a) also requires that a coastal development permit shall be issued only if the Commission finds that the permitted development will not prejudice the ability of the local government to prepare a Local Coastal Program (LCP) in conformity with the provisions of Chapter 3 of the Coastal Act. In this case, such a finding can be made.

Mission Bay Park is primarily unzoned. As a whole, Mission Bay Park is a dedicated public park, and SeaWorld is designated as Lease Area in the presently-certified Mission Bay Park Master Plan (land use plan). Although the Commission has certified the recent Mission Bay Park Master Plan amendment, incorporating the SeaWorld Master Plan as a component, it did so with suggested modifications that have not yet been adopted by the City. The proposed development is consistent with the designation in the Mission Bay Park Master Plan, and has been found consistent with all applicable Chapter 3 policies of the Coastal Act. No modifications to SeaWorld's lease with the City of San Diego, or other local discretionary actions, are required as a result of the improvements proposed herein. The master plan update addresses the height limit ballot measure, which approves greater-than-thirty-foot heights within the SeaWorld leasehold, but leaves final oversight to the City Council and Coastal Commission, who will review each proposed development on a case by case basis. Therefore, the Commission finds that approval of the project, as conditioned, will not prejudice the ability of the City of San Diego to prepare a fully certifiable LCP for its Mission Bay Park segment.

6. California Environmental Quality Act (CEQA). Section 13096 of the Commission's Code of Regulations requires Commission approval of coastal development permits to be supported by a finding showing the permit to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effect which the activity may have on the environment.



As discussed herein, the proposed project will not cause significant adverse impacts to the environment. Specifically, the project, as conditioned, has been found consistent with the public access and recreation, visual resource, and water quality policies of the Coastal Act. There are no feasible alternatives or mitigation measures available which would substantially lessen any significant adverse impact which the activity might have on the environment and still achieve the purpose of the project. Therefore, the Commission finds that the proposed project is the least environmentally damaging feasible alternative and is consistent with the requirements of the Coastal Act to conform to CEQA.

STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
4. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
5. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

COMMISSION ACTION ON SEP 09 2002

- ☒ Approved as Recommended *we, S*  
☐ Denied as Recommended  
☐ Approved with Changes  
☐ Denied  
☐ Other

# MEMORANDUM

TO: JIM ANTRIM, JIM MCBAIN AND PAT OWEN  
FROM: ANN BOWLES  
DATE: 4/19/01  
RE: NOISE LEVELS FROM ROLLER COASTERS AT SWO/BUSCH GARDENS  
CC: TOM GOFF, JACK PEARSON, DON KENT AND PAM YOCHAM,

**RECEIVED**

MAY 10 2002

CALIFORNIA  
COASTAL COMMISSION  
SAN DIEGO COAST DISTRICT

Gentlemen:

I've read Larry Wolski and Rindy Anderson's report regarding the noise from the 'Journey to Atlantis' and other roller-coaster rides at Sea World of Orlando (SWO) and Busch-Gardens Tampa (BGT). A copy is attached for your review. The results are encouraging, as it should be possible to *improve* the noise environment for the Commerson's dolphins, and to prevent undue disturbance at the OSPER facility with some simple modifications to the construction plans.

From my perspective, the important points are as follows (I refer you to Figure 4 in the report):

1. The underwater ambient noise in the pools where the Commerson's dolphins are being held at SeaWorld San Diego is relatively high because their pool is coupled to the pumping and filtration. This noise is broad band, extending well up into the range of frequencies that Commerson's dolphins are thought to hear well ( $> 1000$  Hz). It is also continuous noise (as opposed to transient noise, which only lasts for brief periods).
2. The worst-case underwater exposure at the JTA ride in Orlando was in the splashdown pool. While levels were high briefly during splashdown events (transient levels reached 124.1 dB re 1  $\mu$ Pa), the ambient in the pool was actually lower than the levels currently experienced by the Commerson's dolphins.
3. Exposure in a pool adjacent to the ride was very moderate, particularly at the frequencies that Commerson's dolphins hear best. This was true of both ambient levels and splashdown events.

EXHIBIT NO. 1
APPLICATION NO.
6-01-129
Noise Report
Page 1 of 2
California Coastal Commission

Thus, simply isolating the new Commersons pool from the complex consisting of the ride and water management system will do much to reduce noise. Based on the plans I saw before Christmas, this is exactly how the new pool has been designed.

I also concur with the gist of the suggestions made in the report. My recommendations:

1. Put as much concrete between the new pool and the splashdown areas as possible. Sound is attenuated most effectively by mass. For example, peep holes in a solid wall attenuate noise more effectively than an acrylic wall.
2. Keep noisy sources such as loudspeakers either away from the pool or oriented away from the pool. Visitor noise will come and go, but loudspeakers will raise the ambient in the pool continuously.
3. Protect the surface of the pool from direct line-of-sight to the noisiest parts of the ride (splashdown, visitor entrance) with a wall. As the report shows in several places, sound transmits easily from air to water in shallow pools, but may be dramatically attenuated by a simple and fairly low barricade.

As I mentioned when we first talked about this, I'm also concerned about the noise and disturbance generated by increased traffic around the OSPER facility. I would suggest putting a wall around it that would block noise and traffic both from the people coming in to the ride and from the ride itself.

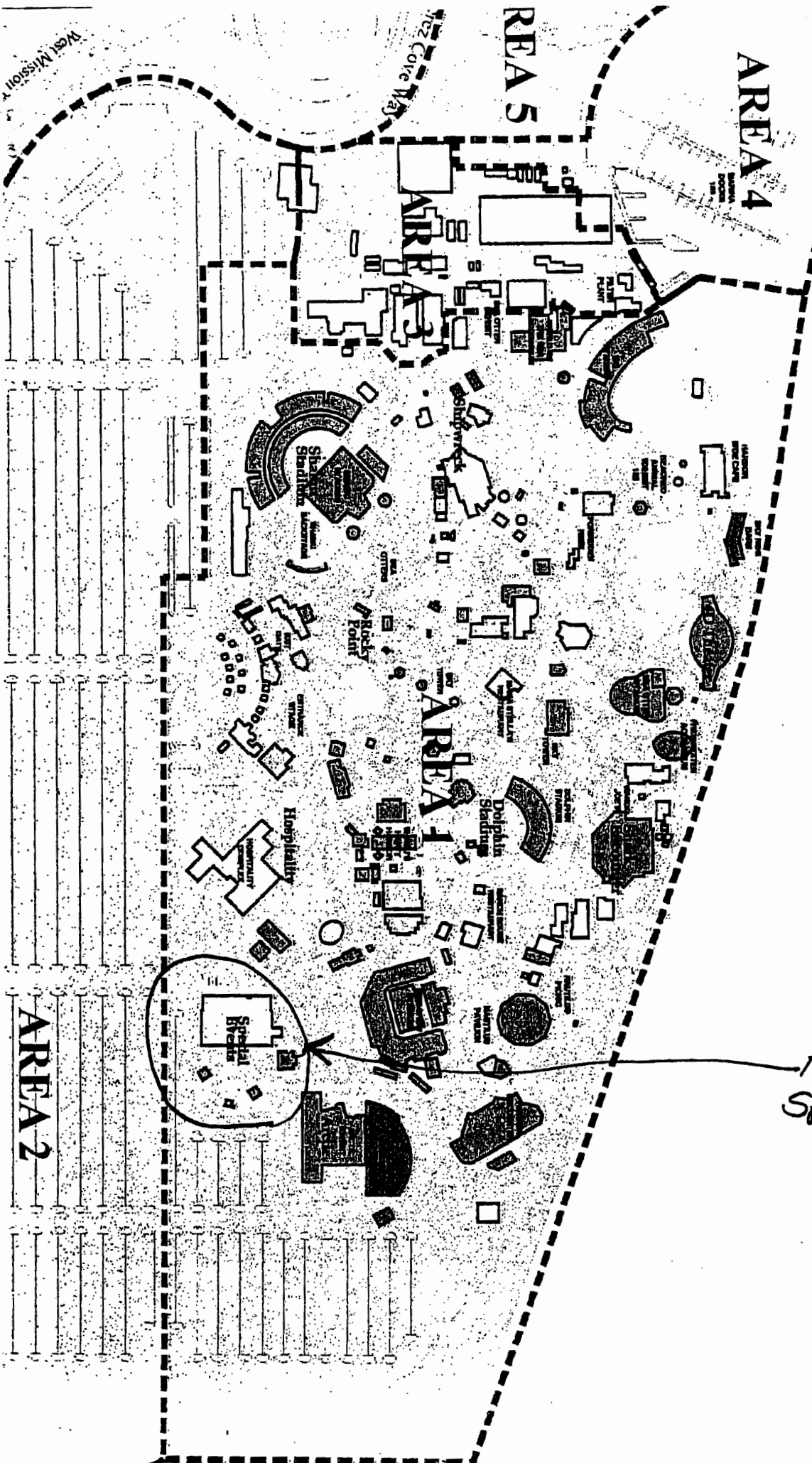
EXHIBIT NO. 1
APPLICATION NO. 6-01-129
Noise Report
Page 2 of 2
California Coastal Commission

6-01-129



EXHIBIT NO. 2  
APPLICATION NO.  
6-01-129  
Location Map

6-01-129



Area for  
Splash Down Ride

EXHIBIT NO. <b>3</b>
APPLICATION NO. <b>6-01-129</b>
Site Plan
<b>Developed Area</b> California Coastal Commission

6-01-129

*Proposed*

W 13,000

W 12,000

W 11,000

EXHIBIT NO. 4
APPLICATION NO.
6-01-129
Conceptual Plan for Ride
California Coastal Commission

# THE MASTER PLAN

SeaWorld  
ADVENTURE PARK  
San Diego

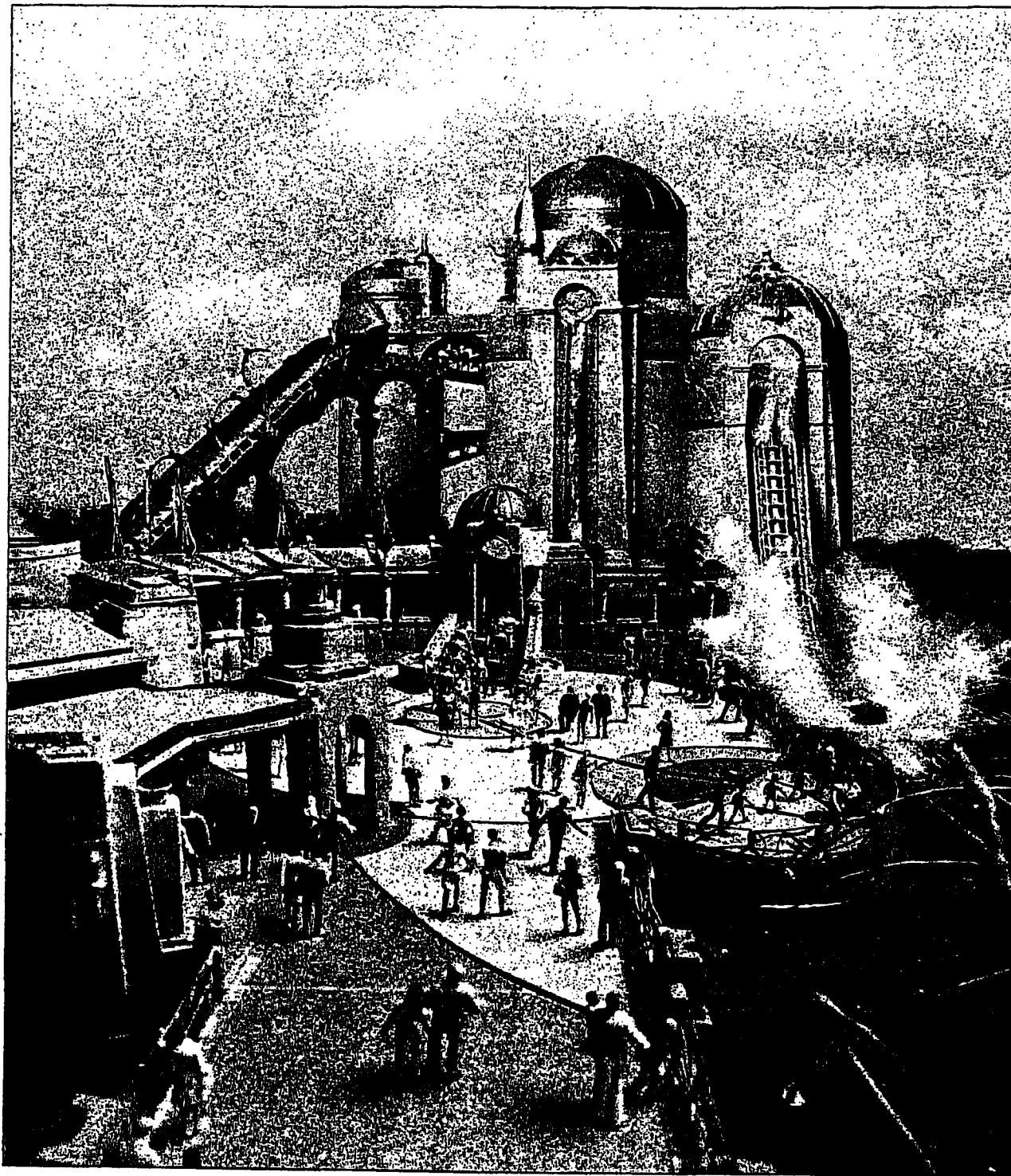


Figure II-5 Conceptual Splashdown Ride Elevation

SeaWorld Master Plan Update

\* Views from Outside SeaWorld are

EXHIBIT NO. <b>5</b>
APPLICATION NO. <b>6-01-129</b>
Conceptual elev from <u>inside</u> SeaWorld

