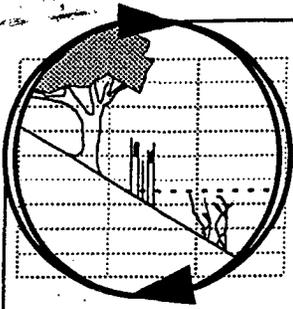


# ATTACHMENT 36



# Merkel & Associates, Inc.

4455 Murphy Canyon Road, Suite 120 • San Diego, CA • 92123  
Ph. (619) 560-5465 • Fax (619) 573-0069

13 ACRES OF  
NEW EELGRASS!

May 25, 1995  
M&A# 95-037-01

Ms. Melissa A. Mailander  
Associate Environmental Management Analyst  
San Diego Unified Port District  
3165 Pacific Highway  
San Diego CA 92101

**RECEIVED**

**MAY 25 1995**

PORT OF SAN DIEGO  
ENVIRONMENTAL MANAGEMENT

**Re: Eelgrass Survey of the North Dike of the Chula Vista Wildlife Reserve**

Dear Melissa,

## INTRODUCTION AND PURPOSE

Merkel & Associates, Inc. has been retained by the San Diego Unified Port District (SDUPD) to re-map and assess the status of eelgrass resources along the north dike of the Chula Vista Wildlife Reserve Island. Work has been conducted under SDUPD P.O. #71120.

The purpose of this report is to transmit information regarding the survey methods and results, as well as to provide a qualitative assessment of the current vigor of the eelgrass community bayward of the north dike in the Chula Vista Wildlife Reserve Island. An eelgrass bed in this area was originally planted in 1988 as part of a mitigation project (Merkel 1988). Although the transplanted bed was almost totally destroyed months later by rapid sedimentation, subsequent monitoring surveys have revealed remarkable eelgrass recovery across the original transplant site. Eelgrass coverage recorded in a May 1994 survey (conducted by MBC Applied Environmental Sciences (MBC)) totalled 261,297 sq. ft. (MBC 1994), almost 300 times greater coverage than the 850 sq. ft. of coverage noted in a 1992 survey conducted by Pacific Southwest Biological Services (Merkel 1992).

## PROJECT STUDY AREA

The eelgrass study area extends along 2,400 linear feet of the north dike of the Chula Vista Wildlife Reserve and reaches approximately 350 ft. into the bay terminating at the San Diego Gas & Electric Company South Bay Power Plant cooling water intake

channel, just south of the Chula Vista Marina (Figure 1.). The study area occupies approximately 19.2 acres of south San Diego Bay.

The study area ranges in depth from +3 ft. MLLW (intertidal baseline) to approximately -4 ft. MLLW at the edge of the intake channel.

## SURVEY METHODOLOGY

On May 17, 1995, an eelgrass survey was completed by Kevin J. Cull and Holly D. Hanson of Merkel & Associates, Inc. This survey, like the May 1994 survey conducted by MBC, consisted of a survey along a 2,400 foot long baseline established adjacent to the berm on the shore of the north dike in a west-northwest to east-southeast direction. A total of 25 parallel transects spaced at 100-foot intervals were extended from the baseline into the bay as far as the intake channel edge. The first transect began at the western edge of the north dike. Transects were oriented 25 degrees east of true north, perpendicular to the baseline. Eelgrass beds were measured bayward from the baseline using standard line-intercept transect methodology. A diver utilizing a hand compass for orientation swam each transect line towing a fiberglass measuring tape. The starting and ending points of each eelgrass bed were recorded. Gaps exceeding three feet in width were also recorded as open bay bottom. Measurements were taken until the diver reached the SDG&E cooling water intake channel approximately 350 feet from shore where the bottom dropped sharply to the bottom of the channel.

During the course of the survey, turion counts were conducted along each transect within a  $1/16 \text{ m}^2$  quadrat in order to determine the density of actively growing turions (upright shoots supporting numerous leaves in a single sheathed point of origin) within the eelgrass beds. The quadrat was placed at the approximate mid-point of each transect (25 locations) in the eelgrass to develop a mean density for the eelgrass bed.

Density and coverage measurements were also taken along three transects located at an eelgrass bed located along the Chula Vista Bayside Park. This bed served as a control to compare it to conditions at the bed along the north dike. Transects were placed at 100 ft intervals and extended approximately 280 feet into the bay to the Chula Vista Marina channel.

Utilizing the data collected in the field and adjusting for tidal differences eelgrass was mapped onto a topographic map of the Chula Vista Wildlife Reserve provided by the District with a scale of  $1" = 100 \text{ ft.}$  (Figure 2.).

## SURVEY RESULTS

The survey revealed eelgrass extending from approximately -1.0 feet MLLW to as deep as -3.5 feet MLLW, the edge of the intake channel (Figure 2). The eelgrass found along the transects appeared to be in excellent health. Shoots observed during the survey were tall in stature and relatively free of epiphytic loading. With the exception of a few patches on the western boundary of the survey site, the eelgrass occurred in a relatively dense, contiguous bed along the north dike and stretched almost to, and in some cases to the edge of the intake channel. Some matting of eelgrass, possibly due to sedimentation, was observed along the eastern portions of the shore-ward third of the main bed, an area subject to greater amounts of island erosion and in an area exhibiting high turbidity originating from the island as the tide ebbed.

The mean shoot density within the eelgrass was determined to be  $158.7 \pm 48.8$  turions/m<sup>2</sup> SD (n=25). The total area of eelgrass in the study area is approximately 13.0 acres (566,880 sq. ft.) more than double the coverage observed at the same time in 1994.

## DISCUSSION

Eelgrass growth has been considerable in the year since the previous May 1994 survey. In the time elapsed since that survey, there has been an increase of approximately 7.4 acres (324,055 sq. ft.) of eelgrass. This gain has occurred mainly along the northern edge of the bed, which now stretches to the intake channel (recall Figure 2.). Additional gain has occurred along the western and eastern edges of the bed; this area was bare except for a few small patches of eelgrass at the time of the May 1994 survey (Figure 3.). While not within the designated survey area, eelgrass was noted to wrap around both eastern and the western ends of the island. The full extent of these beds is unknown. This should be investigated further since the distribution in this area may be useful in evaluating the factors limiting the distribution of eelgrass in the south bay.

The density of the eelgrass bed along the north dike is similar to densities in other areas of the south bay, and the control bed. This assessment is based upon both visual inspection and a comparison of turion densities measured at the north dike bed and the control bed. The mean turion densities from this survey are substantially lower than the densities recorded for the May 1994 survey ( $158.7 \pm 48.9$  turions/m<sup>2</sup> for this survey as compared to an average of 298 turions/m<sup>2</sup> in May 1994). Turion densities for the

control site measured  $240.0 \pm 48.0$  turions/m<sup>2</sup> and were not significantly different from those recorded for the May 1994 survey (256 turions/m<sup>2</sup>).

There is little to suggest the reason for such an explosive increase in eelgrass at the wildlife island during the recent two years. The only significant physical change which has occurred has been the dredging of the intake channel, completed in the early part of 1994. It has been theorized that these deep channels, and particularly those associated with navigation and the South Bay Power Plant allow for greater circulation and removal of silts suspended by afternoon wind waves (Merkel & Associates 1995). However, this remains to be tested.

As indicated above, portions of the bed appear to be suffering from sedimentation. The matted eelgrass could be affected by sediment being carried out with the outgoing tide from the middle drainage through the north dike. This channel drains a portion of the island's tidal flats back to the bay. The shoreward edge of the eelgrass bed has an alluvial shape to it, indicating the forces in effect locally. During the survey a cloudy plume flowing bayward was observed, as the tide was ebbing. The plume extended out to the intake channel.

I hope this letter report provides you with the information you require. If you have any questions or need additional information, please do not hesitate to call me.

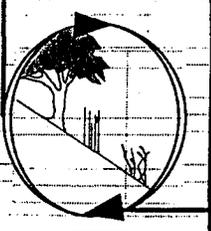
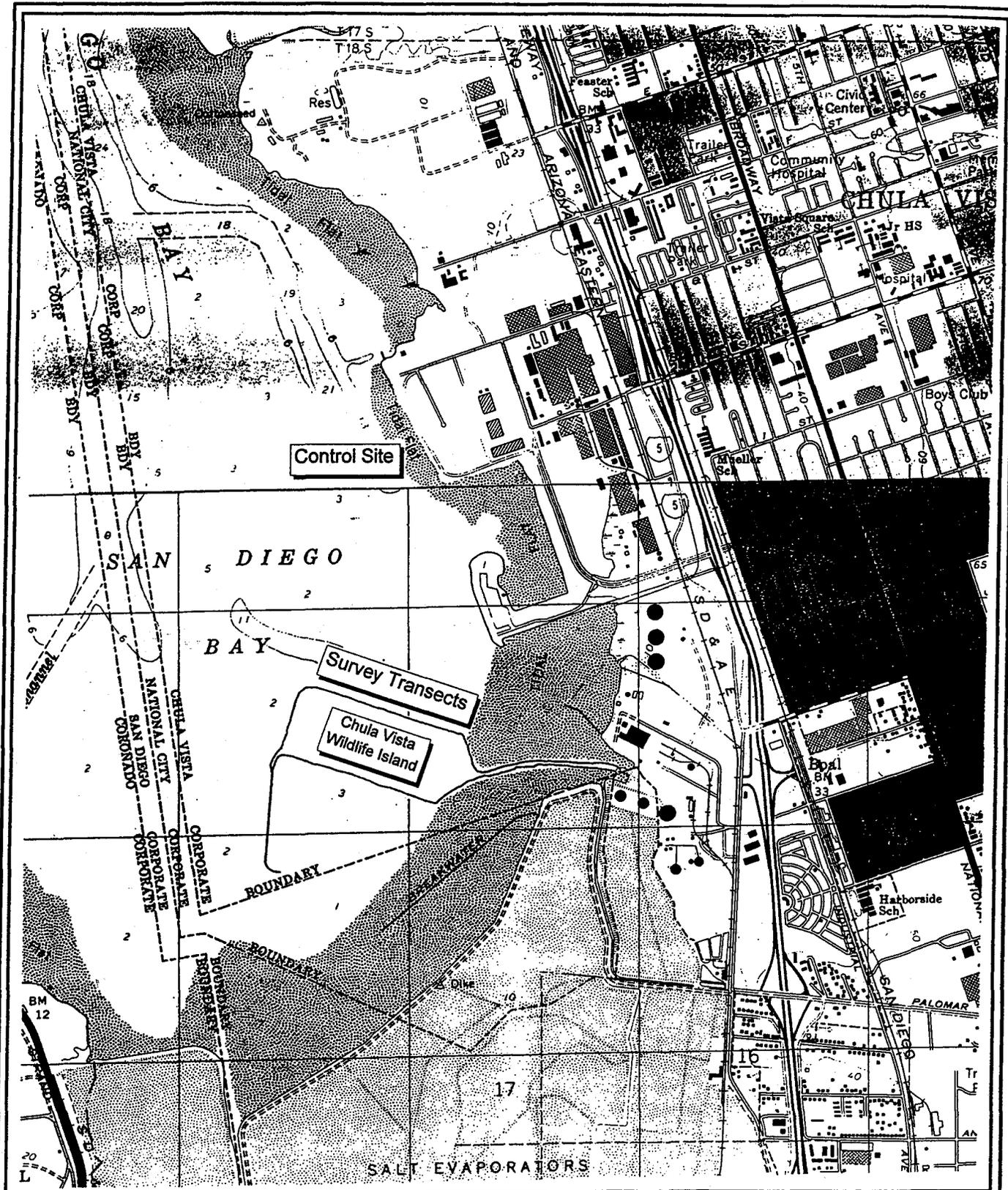
Sincerely,



Kevin J. Cull  
Project Manager

LITERATURE CITED

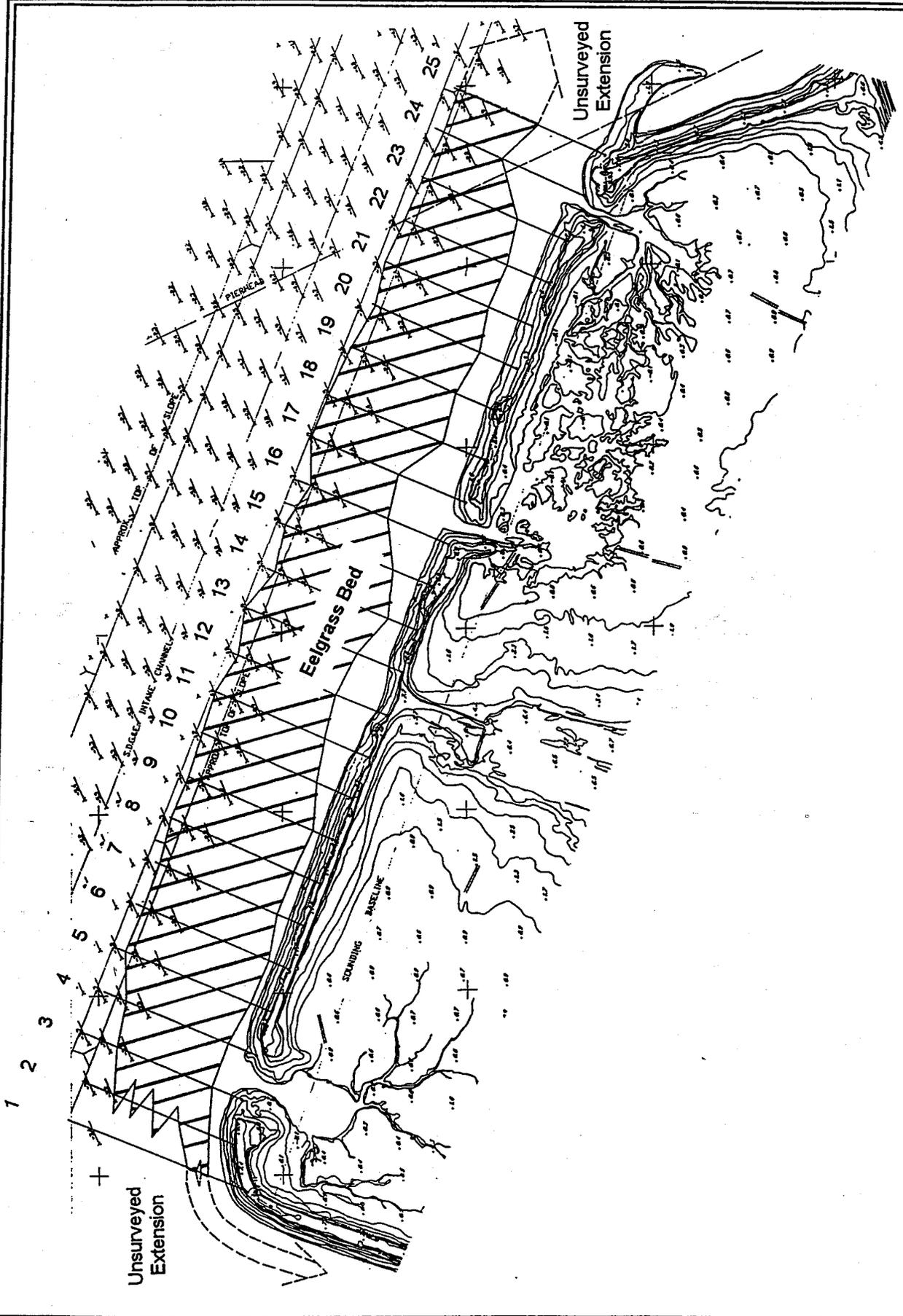
- MBC Applied Environmental Sciences. 1994. Eelgrass Distribution Mapping and Vegetation Survey Bayward of the North Dike Chula Vista Wildlife Reserve. For San Diego Unified Port District, San Diego, California.
- Merkel & Associates, Inc. 1995. Eelgrass Distribution in South San Diego Bay as it Relates to the South Bay Power Plant. For San Diego Gas & Electric Company.
- Merkel K. W. 1992. Eelgrass Distribution Survey Bayward of North Dike Chula Vista Wildlife Reserve Island, Chula Vista, California. For San Diego Unified Port District Project 97-37. San Diego, California
- \_\_\_\_\_. 1988. Proceedings of the California Eelgrass Symposium. Chula Vista, California May 27 and 28, 1988. Sweetwater River Press, National City, California.



↑  
Scale: 1"=2,000'

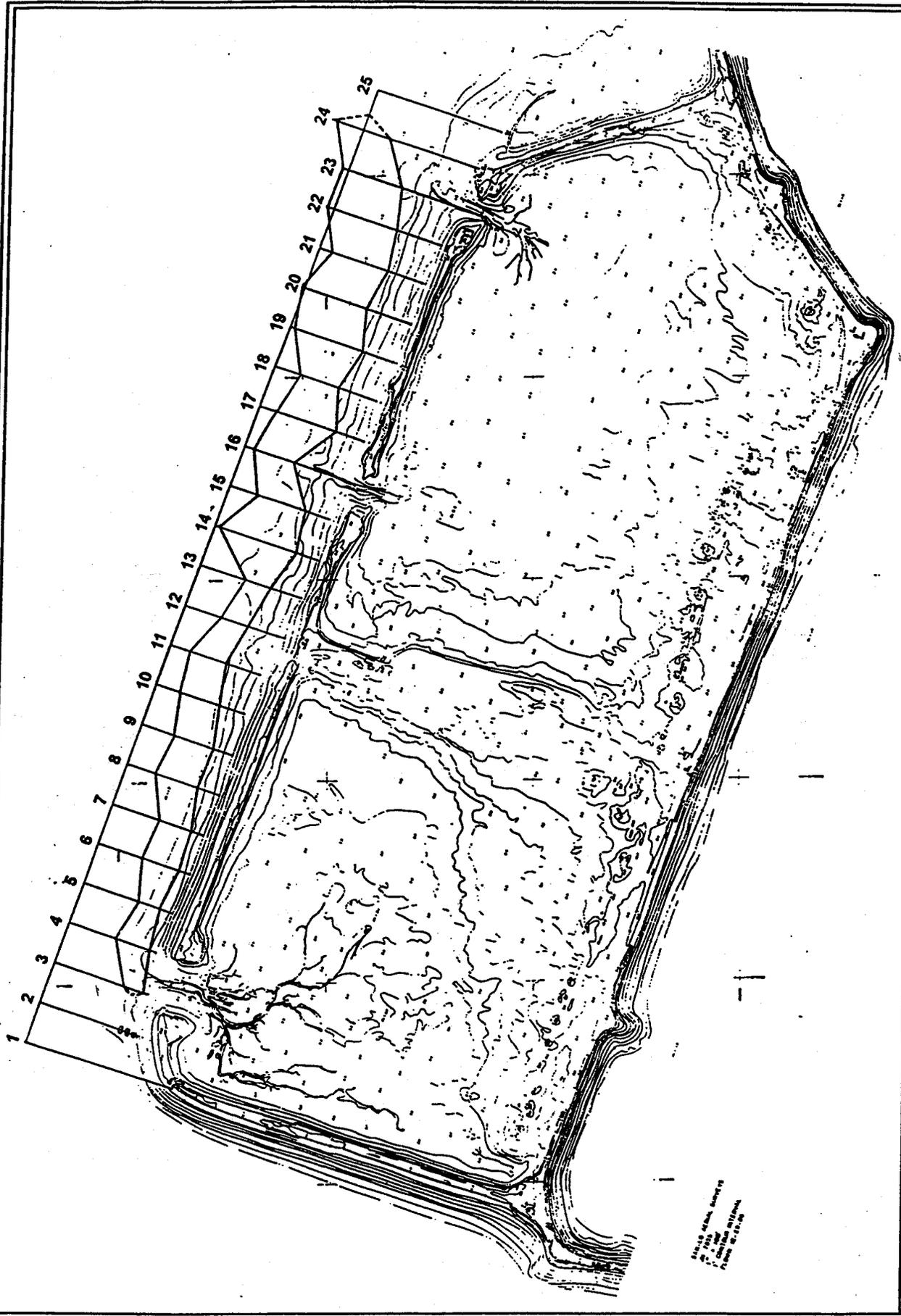
**Project Vicinity Map**  
Source: USGS 7.5' National City and Imperial Beach, CA Quadrangles

Figure  
1



**Eelgrass Distribution Along the North Dike of the Chula Vista Wildlife Island**  
 May 1995

**Figure 2**



Scale: 1"=340'

Eelgrass Distribution Along the North Dike of the Chula Vista Wildlife Island  
 May 1994  
 Source: MBC Applied Environmental Sciences (July 1994 Report)