CALIFORNIA COASTAL COMMISSION
CENTRAL COAST DISTRICT OFFICE
725 FRONT STREET, SUITE 300
SANTA CRUZ, CA 95060
(831) 427-4863

W11a

Filed: 9/8/06
Staff: Susan Craig
Staff report prepared: 9/21/06
Hearing date: 10/11/06

COASTAL DEVELOPMENT PERMIT APPLICATION

Application number.....**3-06-034, City of Santa Cruz Pilot Desalination Facility**

Applicant.....City of Santa Cruz Water Department; Attn: Linette Almond, Deputy Director/Engineering Manager

Project location .....100 Schaffer Road (UCSC Marine Science Campus, Terrace Point), Santa Cruz (Santa Cruz County)

Project description.....Construction and operation of a pilot-scale test desalination facility.

Local approval.....Certification of the Final Program Environmental Impact Report for the Integrated Water Plan by the City Council of the City of Santa Cruz (November 8, 2005); Determination by UCSC Director of Campus Planning that proposed project complies with proposed CLRDP.

File documents.....Integrated Water Plan Final Program Environmental Impact Report (October 2005)

Staff recommendation ...**Approval with Conditions**

Summary: This staff report evaluates a permit application for a proposed pilot-scale desalination test facility to be constructed and operated by the City of Santa Cruz Water Department. The purpose of the proposed pilot-scale facility is to allow for the gathering of information needed for the design and construction of a potential future full-scale Seawater Reverse Osmosis Desalination plant.

The proposed pilot-scale desalination project is located on University of California property within the City limits of Santa Cruz, in an area of deferred certification. Thus, the standard of review for the project is the Coastal Act.

The pilot plant would operate at the UCSC Long Marine Lab (LML) complex on UCSC's Marine Science Campus at Terrace Point in the City of Santa Cruz. It would use UCSC's existing seawater intake and outfall facilities for source and discharge waters. The proposed pilot plant would cause no additional entrainment above that which is already caused by LML's seawater intake. After the facility processes the seawater through the desalination systems, it would recombine the various water streams and return what would essentially be reconstituted seawater for use by LML. Therefore, it would not require LML to draw in additional make-up water to replace that used by the desalination facility. To further avoid entrainment impacts, the applicant has committed to operate the desalination facility only when LML is operating and pulling in seawater.

The proposed pilot facility will operate from 12 to 18 months, within the term of LML's existing National Pollutant Discharge Elimination System (NPDES) permit. To ensure potential impacts to water quality and marine biology are avoided or otherwise minimized, the permit is conditioned to require the permittee to notify the Executive Director if there is a change in LML's operations or its NPDES permit requirements that would affect construction and/or operation of the pilot desalination facility.

The pilot plant facility would be located in an area intended to be covered by a Long Range Development Plan (LRDP) currently under development by UCSC, which will be submitted to the Commission for review in the next few months. The proposed project would take place in an area identified for outdoor research, parking, and public access improvements in the current version of the LRDP. This area is mostly undeveloped and provides some informal parking as well as a public access trail link to the shoreline. The ultimate land use plan for this area will be determined through the Commission's LRDP review process. The applicant mostly has designed the project so that the site will be returned to existing conditions at the end of the project life, if this is necessary to assure consistency with the LRDP. For example, the proposed concrete pad for the facility will be removed if the LRDP ultimately does not contemplate such a land use in this area (to date, staff has concurred with UCSC that the footprint of the proposed desalination building would ultimately be an appropriate location for low intensity outdoor marine research activities). The City has also proposed certain public access improvements designed to work within the larger context of potential planned public access improvements in this area under the LRDP. To this end, staff is recommending conditions to ensure that the temporary development of this area both protects existing public access and does not foreclose or otherwise dictate the ultimate use, configuration, and design of this area with respect to potential future maximization of public access opportunities that may be included in a certified LRDP.

Staff recommends that the Commission find that the project, as conditioned, is consistent with the marine resource, public access and recreation, and visual policies of the Coastal Act, and recommends that the Commission approve the coastal development permit, as conditioned, for the proposed project.

Staff Report Contents

I. Staff Recommendation on CDP Application

Staff recommends that the Commission, after public hearing, **approve** a coastal development permit for the proposed development subject to the standard and special conditions below:

Motion. I move that the Commission approve Coastal Development Permit Number 3-06-034 pursuant to the staff recommendation.

Staff Recommendation of Approval. Staff recommends a **YES** vote. Passage of this motion will result in approval of the coastal development 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 a Coastal Development Permit. The Commission hereby approves the coastal development permit on the grounds that the development, as conditioned, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the coastal development 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 feasible mitigation measures or alternatives that would substantially lessen any significant adverse effects of the development on the environment.

II. Conditions of Approval

A.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.

B. Special Conditions

1. **CHANGE TO PROJECT CONSTRUCTION OR OPERATION:** The permittee shall notify the Executive Director of any modification to Long Marine Lab (LML) or to LML's NPDES permit that may affect construction and/or operation of the test desalination facility as described in the project description in the application and as modified by these Special Conditions. Such construction or operational changes shall not be incorporated into the project until the permittee obtains a Commission amendment to this coastal development permit, unless the Executive Director determines that no amendment is legally required.

2. **Final Plans. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT**, the Applicant shall submit two sets of full-size Final Plans (with a graphic scale) to the Executive Director for review and approval. The Final Plans shall be substantially in conformance with the plans submitted to the Coastal Commission (i.e., the 11" x 17" plans received in the Coastal Commission's Central Coast District Office on August 9, 2006) but shall show the following changes and clarifications to the project:

   a. **Decomposed Granite Replaces Pavement.** The proposed pavement area shall be modified to eliminate all paving east of the Younger building, east of the temporary desalination building, and east of the gates depicted as attached to the north and south sides of the temporary desalination building (see Exhibit #2). Decomposed granite shall instead be installed in these areas and integrated with the proposed adjacent decomposed granite areas and with adjacent landscaping.

   b. **Eliminate Valley Gutter.** The proposed valley gutter (extending from the northern end of the Younger Building to the southern end of the pilot desalination plant site, as shown in

Exhibit #2) and its associated inlet and any connecting pipes shall be eliminated, and the decomposed granite area configured in such a way as to avoid drainage problems, including by maximizing infiltration (e.g., adjusting underlying soil as necessary) and to allow for the drainage that does not infiltrate through the decomposed granite to be directed to existing Long Marine Laboratory water quality filtration and treatment devices. The pavement area and valley gutter closest to the Seymour Marine Discovery Center (east of the area in which pavement is to be removed and replaced with decomposed granite) may also be removed and replaced with decomposed granite under this authorization.

c. **Public Access Signs**. The first public access sign located adjacent to the Younger Building (as shown on Exhibit #2) shall be a minimum of two feet by two feet in size. The second public access sign located at the southern end of the pilot desalination plant site (as shown on Exhibit #2) shall be a minimum of one foot by one foot in size. Both signs shall be clearly visible and understood to users of the public trails as seen from the north, and shall include the California Coastal Commission's wave and footprint logo, a directional arrow, and the following text only: "Public Coastal Access" and secondary text in a slightly smaller font that indicates "Coastal View."

The Applicant 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 a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is necessary.

3. **Timing.** All interpretative and public access signs and all decomposed granite areas shall be installed prior to operation of the test desalination facility.

4. **Parking/Vehicular Use as Temporary Only – Restoration Required.** This coastal development permit authorizes only temporary parking and vehicular use areas (as shown on Exhibit #2) for the 12 to 18 months of operation of the temporary desalination facility.

III. Recommended Findings and Declarations

The Commission finds and declares as follows:

A. Project Location & LRDP Background

The City of Santa Cruz proposes to develop a temporary desalination facility on a site located within the UCSC Long Marine Laboratory (LML) cluster of buildings on UCSC's Terrace Point. Terrace Point is located along the shoreline between urban Santa Cruz to the east and the rolling agricultural fields of the north coast of Santa Cruz County to the west (see Exhibit #1 for project location). The Terrace Point site is currently developed with LML and related UCSC facilities, the California Department of Fish and

Game's (CDFG) Marine Wildlife Veterinary Care and Research Center, and the National Oceanic and Atmospheric Administration's (NOAA) Fisheries Lab. The majority of the Terrace Point property is within an area where the Commission deferred LCP certification prior to the University's acquisition, and because the remainder has been in University ownership since 1975, all development authorized on the site to date has been by virtue of Coastal Commission action with the Coastal Act as the standard of review (approximately three dozen Commission actions to date).

As an alternative to project-by-project coastal permit review, Coastal Act Section 30605 allows the University to develop a long range development plan (LRDP) for the site that can be certified by the Commission. Similar to an LCP, the University would be the responsible entity for ensuring that future development on the site was consistent with a certified LRDP, subject to Commission oversight. Since the late 1990s, UCSC has been working on such an LRDP for the Terrace Point site. This past year, the University submitted its proposed LRDP for Commission review. Following several Commission hearings on the LRDP, the University withdrew the proposed LRDP at the Commission's April 2006 hearing in order to more fully respond to Commission concerns. As of the date of this staff report the University has not yet resubmitted a revised LRDP. The University indicates that it will be submitted in the next few weeks. Thus, the LRDP is likely to be in front of the Commission in the next several months.

B. Project Description

The proposed project involves the construction and operation of a temporary desalination test facility to be publicly owned and operated by the City of Santa Cruz Water Department. The purpose of the project is to test various types of desalination equipment and techniques to determine their effectiveness, cost, and efficiency in desalting seawater. Ultimately, the intent of the desalination pilot facility is to help the City identify the relative feasibility of developing a full-scale desalination facility, which would be sited at another location, not at UCSC's Marine Science Campus, and which would be subject to additional and separate review by the Commission. Please see Exhibit #2 for conceptual site plans of the test facility and Exhibit #3 for project plans.

The proposed desalination test facility is designed to use seawater drawn from an intake that is currently being used by the University of Santa Cruz's Long Marine Lab (LML) and affiliated marine research partners (including CDFG and NOAA Fisheries) at the Marine Science Campus (the City has a license agreement with the University regarding the pilot desalination facility). Long Marine Lab's seawater intake and discharge have been previously authorized by the Commission and are also covered pursuant to a National Pollutant Discharge Elimination System (NPDES) permit issued by the Central Coast Regional Water Quality Control Board (Waste Discharge Requirements [WDR] Order No. R3-2002-0076, NPDES General Permit for Discharges from Aquaculture and Aquariums). The existing system generally pulls in about 800,000 gallons per day of seawater (at a rate of about 600 gallons per minute) for its flow-through seawater system, which provides water for its various research tanks, pools, and aquaria. The seawater intake is located at Terrace Point in Santa Cruz. After the seawater is drawn in to the intake, it passes through a sand filter and is briefly stored before being distributed throughout the

Campus as needed.

The desalination test facility would use about 50 gallons per minute of LML's 600 gallon-per-minute flows. The seawater would be drawn from LML's intake just before it reaches the sand filter. The facility would desalinate the water using various techniques and equipment to test different types of membranes, pre-treatment and treatment methods, and other techniques. After processing, the facility would then recombine the produced potable water and the various brine streams to create reconstituted seawater that would be returned to LML for use in LML's research tanks. This reconstituted water is expected to have a similar salinity and many of the same characteristics as natural seawater. Many of the solids removed during the various processes (up to about 20 pounds per day) would be routed to the City's sanitary sewer system. The desalination facility would operate 24 hours per day, seven days per week for 12 to 18 months; however, to prevent it from independently causing impacts to water quality or marine biota, it would operate only when LML is drawing in seawater.

This permit authorizes placement and operation of the desalination test equipment, connection to the existing Long Marine Lab seawater intake system, and discharge of the treated and recombined water to LML's water system for up to 18 months. It does not authorize any other activities that may be associated with a larger or more permanent desalination facility, as such a proposal will require additional review for conformity to the Coastal Act regarding a variety of issues, including, but not limited to, energy consumption and impacts to marine resources due to entrainment of marine organisms and discharge of brine.

C. Coastal Act Issues

1. Water Quality and Marine Biological Resources

Coastal Act Section 30230 states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations 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, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Coastal Act Section 30231 states:

> *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.

The project has the potential to cause adverse effects to water quality and marine biology in two main ways: through entrainment of marine organisms and through discharges or releases of various chemicals during the desalination process. As described below, the project has been designed to avoid or minimize these adverse effects.

a. Marine Biology – Entrainment:

The project involves withdrawing up to about 72,000 gallons per day of seawater (50 gallons per minute) from the intake used by Long Marine Lab (LML). Generally, the use by a desalination facility of seawater drawn from an open water intake such as this results in 100% mortality of the plankton, larvae, and fish eggs present in the water. Although this facility would result in this same level of mortality, it is designed to not cause any entrainment mortality beyond what is already resulting through LML's ongoing use of seawater. The facility would only use seawater already being drawn in through the permitted LML intake, and would therefore not entrain any organisms that would not otherwise be entrained by LML. Additionally, after the facility processes the seawater through the desalination systems, it would recombine the various water streams and return what would essentially be reconstituted seawater for use by LML. Therefore, it would not require LML to draw in additional make-up water to replace that used by the desalination facility. To further avoid entrainment impacts, the applicant has committed to operate the desalination facility only when LML is operating and pulling in seawater. Finally, the desalination facility will operate for only about 12 to 18 months, within the term of LML's existing NPDES permit.

b. Water Quality – Discharge of Chemicals:

The project would require the use of various chemicals during the desalination processes and water testing. Chemicals to be used include ferric chloride, sodium hypochlorite (chlorine), sodium hydroxide, sulfuric acid, citric acid, and polymer coagulants. They would be used at concentrations approved for drinking water treatment applications.

The chemicals listed above are approved for use in treating drinking water. They are to be discharged at concentrations below water quality limits as determined by the Regional Water Quality Control Board, and are not expected to be harmful to marine biota. In fact, as noted above, the desalination facility is designed to recombine the produced water and brine streams to create what would essentially be reconstituted seawater that would then be routed to a storage-and-mixing tank before being used in LML's marine mammal research pools. Some water produced during occasional cleaning of the desalination equipment would contain high concentrations of these chemicals. This water, along with up to 20 pounds per day of solids produced during the desalination process (e.g., from filtering, flocculation, etc.) would be routed to the City's municipal sewer system.

To ensure these potential impacts to water quality and marine biology are avoided or minimized, Special Condition #1 requires the applicant to notify the Executive Director if there is a change in LML's operations or its NPDES permit requirements that would affect construction or operation of the test

desalination facility. Such a change may result in the need for an amendment to the test facility's coastal development permit. As conditioned, the Commission finds that the project is consistent with Sections 30230 and 30231 of the Coastal Act.

2. Public Access/Parking

Coastal Act Section 30604(c) requires that every coastal development permit issued for any development between the nearest public road and the sea "shall include a specific finding that the development is in conformity with the public access and public recreation policies of [Coastal Act] Chapter 3." The proposed project is located seaward of the first through public road. Coastal Act Sections 30210 through 30213, 30220, and 30221 specifically protect public access and recreation. In particular:

> ***Section 30210:*** *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*
>
> ***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…*
>
> ***Section 30213:*** *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …*
>
> ***Section 30220:*** *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*
>
> ***Section 30221:*** *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.*

Protection and maximization of public access is one of the significant issues currently being addressed through the planning process for the UCSC Coastal LRDP for Terrace Point. Thus, it is important that the City's proposed pilot desalination facility avoid impacts to existing access or conflicts with potential future access in the vicinity of the project. In particular, public access to the bluff top, including to an established overlook and bluff trail, currently exists next to the project site (see Exhibit #2). This access exists partly by virtue of a Commission-approved interim public access plan in place until such time as

the LRDP may be certified. In addition, future public access improvements in the project area, including potentially reopening public access to Younger Lagoon beach, remain to be addressed through the Commission's LRDP review. The proposed desalination test facility and its nine parking spaces will be located adjacent to this public access and, as currently designed, could have the effect of narrowing the perceived through-corridor that currently exists. The proposed project will also require vehicle use of the existing pedestrian access.

The City of Santa Cruz has worked with the University and Commission staff in an effort to define a pilot desalination facility that protects and enhances existing public access resources at the site and that avoids conflicts with pending public access concerns. First, the project is a temporary facility and the City has committed, with a few exceptions, to restoring the site to its existing condition if necessary. The concrete pad that would support the proposed building may in fact be retained if the certified LRDP allows land uses, such as marine mammal pools and research activities, that could take advantage of such infrastructure, and if the University pursues such development pursuant to the LRDP. The City, however, would remove the pad in the event that this was not the case. The City also proposes installing paving and drainage facilities (see Exhibit #2) in areas where such development may not be necessary to support future planned land uses, or where other surfacing and landscaping may be more desirable in order to fully protect and enhance existing and proposed public access at the site. For example, the paving would support parking for the temporary facility, but formal long-term parking at this location (which to date has not received any coastal development permit approval) may not be appropriate in the context of the larger LRDP and the Commission's mandate to maximize public access at Terrace Point. Special Conditions #2a and #2b therefore require that certain paved areas and the proposed gutter be removed from the project plans. Special Condition #4 notes that the parking authorized by this permit is allowed for the 12 to 18 months of operation of the test desalination facility.

Second, the City has also proposed implementing certain "Phase 1" public access improvements, including removing some existing paving in order to better define a pedestrian walkway to the bluff, installation of native plant landscaping, and installation of clear public access signage. The project also includes a specific public outreach and accessibility component to "educate the public regarding the desalination process and the City's water needs." This component includes docent-led tours of the facility, web-based information, and an interpretive sign at the site. Generally, these improvements would protect and enhance existing access resources and would be constructed to integrate with currently anticipated "Phase 2" access improvements by the University pursuant to the LRDP. For the most part, these proposals are consistent with the Coastal Act. However, Special Condition #2c is needed to assure that new public access signage is conspicuous and provides clear guidance to the public as to existing public access resources. Additionally, Special Condition #3 requires installation of all interpretive and public access signs and all decomposed granite areas prior to operation of the pilot desalination facility. As conditioned, the Commission finds that the project is consistent with the public access and recreation policies of the Coastal Act.

3. Visual Resources

Coastal Act Section 30251 protects the scenic and visual qualities of the coastline and states:

> *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. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.*

The Campus site is currently developed with a number of facilities, some of which are leased by the University to other entities and agencies, and others that operate as primary UCSC facilities. The proposed test desalination plant will be located within the LML complex of facilities, which include the developments located closest to the ocean on the Terrace Point site. The LML complex includes the Seymour Marine Discovery Center, the Younger Building, the Ocean Health Building, several single-wide caretaker trailers, seawater tanks, and associated outdoor laboratory equipment (see Exhibit #6 pp. 1-2).

The proposed project also includes nine parking spaces adjacent to the desalination facility (as shown in Exhibit #2), which could cause visual impacts to visitors to the public access areas located seaward of the test facility site. As discussed in the public access/parking section above, formal long-term parking at this location (which to date has not received any coastal development permit approval) may not be appropriate in the context of the larger LRDP and the Commission's mandate to maximize public access at Terrace Point. For this reason, Special Condition #4 authorizes parking in this area as a temporary use only for the length of time (12-18 months) that the test desalination facility is in operation.

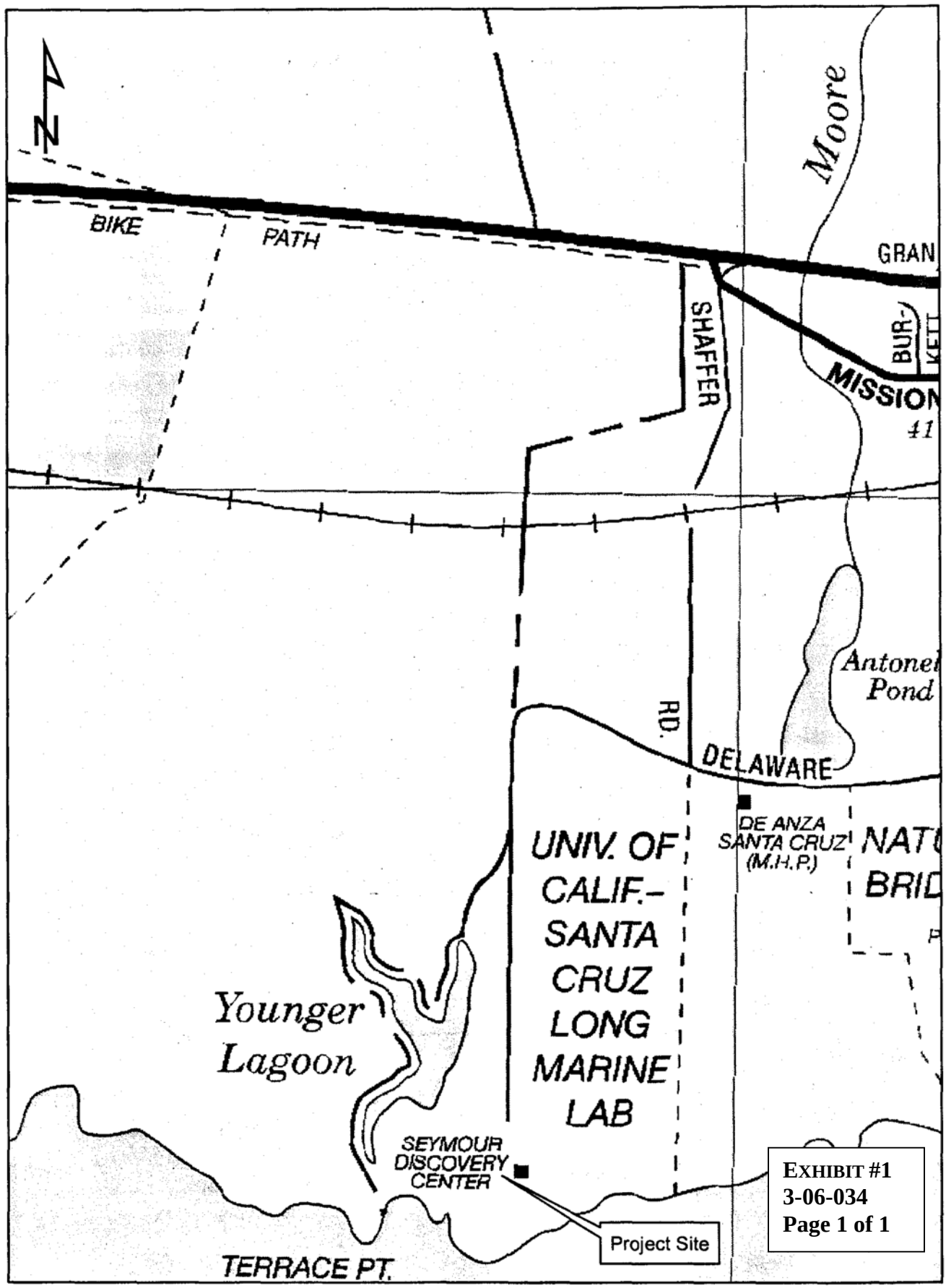
The proposed test desalination facility will be located in a 2,400 square foot building that will have a maximum height of 14 feet 6 inches. The size and the height of the proposed facility are smaller in scale than the adjacent Seymour Marine Discovery Center, the Younger Building, and the Ocean Health Building. Additionally, the proposed desalination facility will not block views down the pedestrian path to the edge of the bluff. Also, the proposed desalination facility will be temporary (12-18 months) and the parking use associated with the facility will also be temporary, as required by Special Condition #4. The concrete pad that will support the test facility and the test facility building itself will be removed at the end of the facility's use (unless the certified LRDP allows retention of the concrete pad), and the site will be restored to decomposed granite. For all these reasons, the proposed project is consistent with Coastal Act Section 30251 regarding protection of visual resources.

IV. California Environmental Quality Act (CEQA)

Section 13096 of the California Code of Regulations requires that a specific finding be made in conjunction with coastal development permit applications showing the application to be consistent with any applicable requirements of 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.

The Coastal Commission's review and analysis of land use proposals has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. This staff report has discussed the relevant coastal resource issues with the proposal, and has recommended appropriate mitigations to address adverse impacts to said resources. Accordingly, the project is being approved subject to conditions which implement the mitigating actions required of the applicant by the Commission (see Special Conditions). As such, the Commission finds that only as modified and conditioned by this permit will the proposed project not have any significant adverse effects on the environment within the meaning of CEQA.

Vicinity Map



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3-06-034
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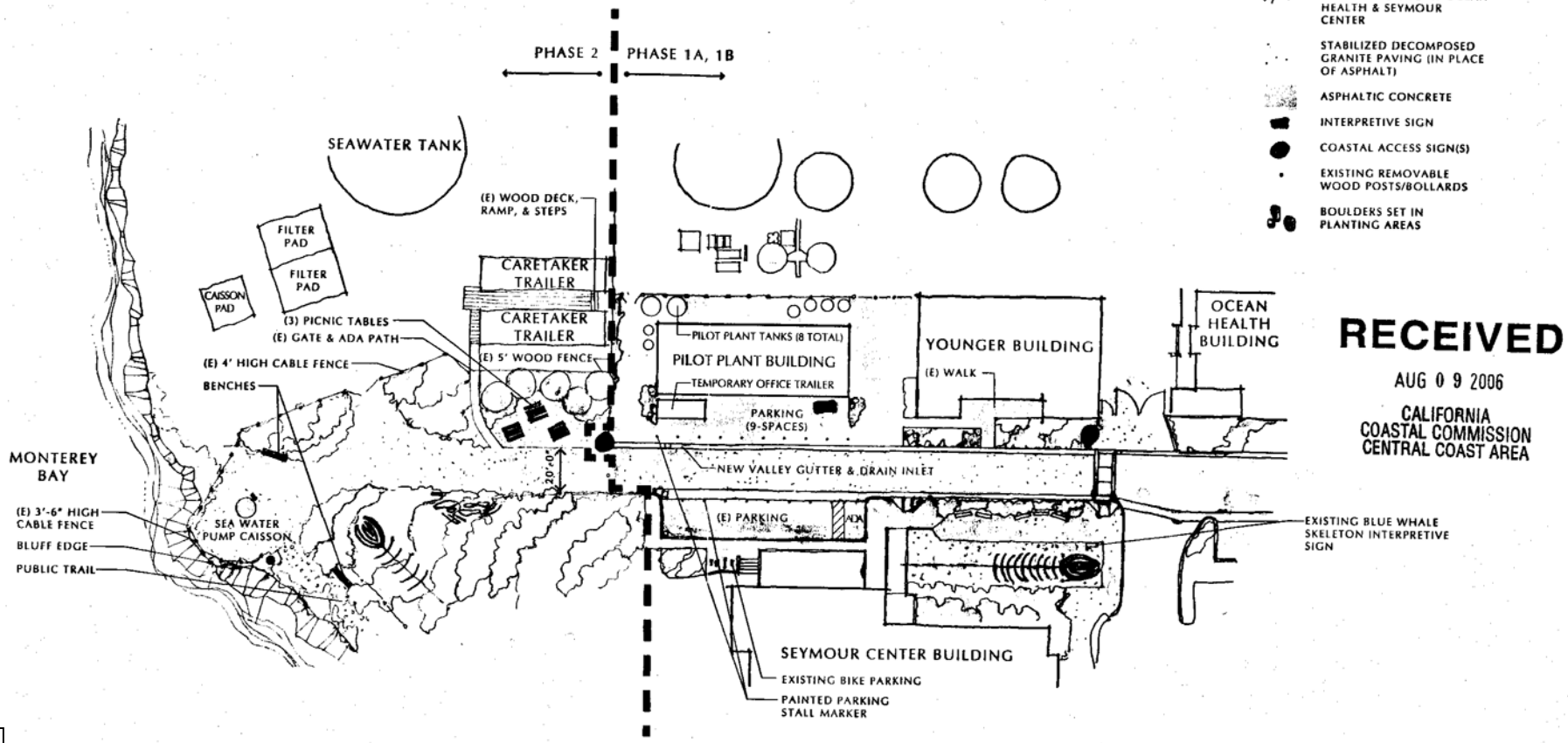

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CALIFORNIA COASTAL COMMISSION CENTRAL COAST AREA

PHASE 1A - Proposed Pilot SWRO
University of California, Santa Cruz
City of Santa Cruz
Long Marine Lab Public Access & Pilot Study

CONCEPTUAL PLAN | PREPARED BY: JONI L. JANECKI & ASSOCIATES, INC. August 4, 2006

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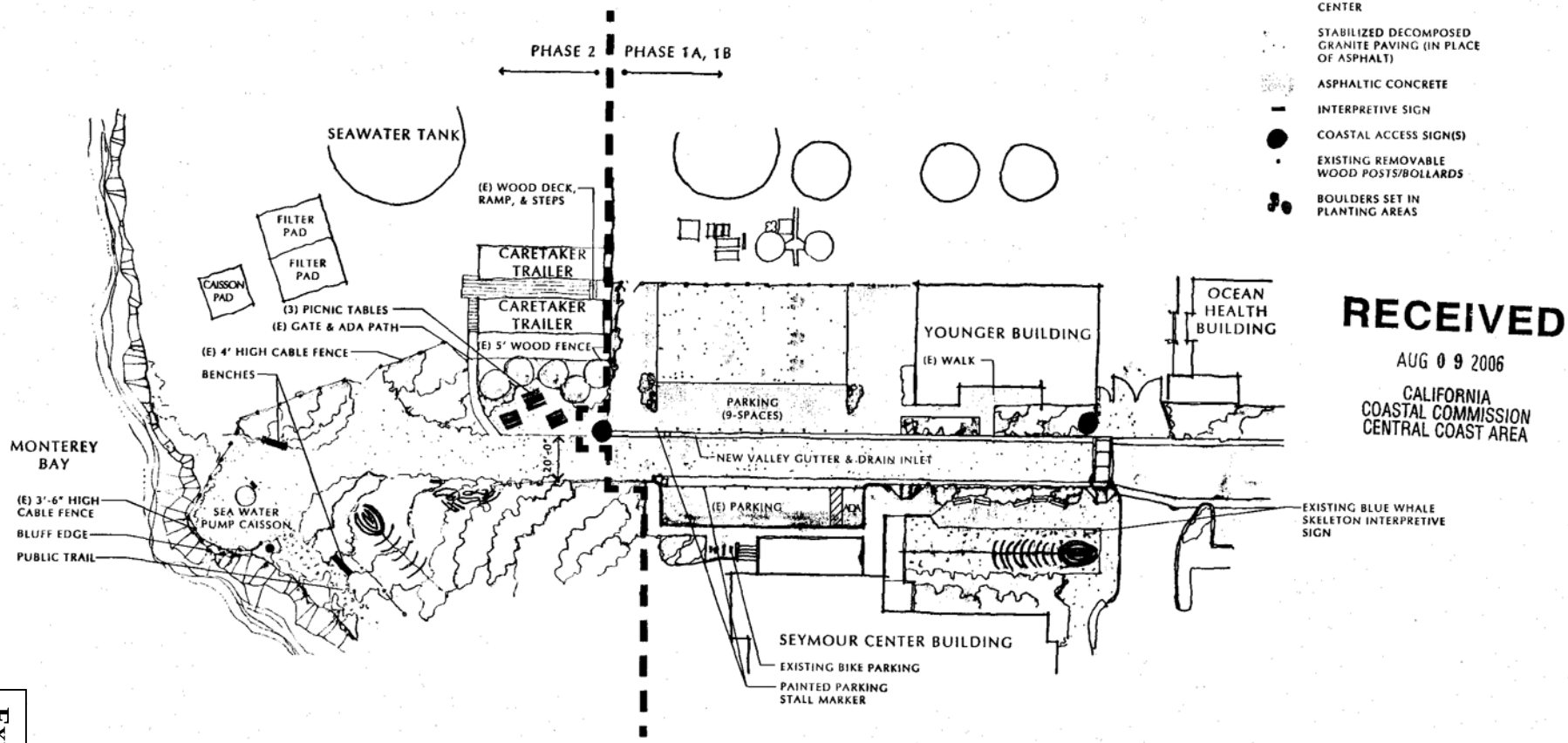

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CALIFORNIA COASTAL COMMISSION CENTRAL COAST AREA

PHASE 1B - Post Pilot SWRO
University of California, Santa Cruz
City of Santa Cruz
Long Marine Lab Public Access & Pilot Study

CONCEPTUAL PLAN

PREPARED BY: JONI L. JANECKI & ASSOCIATES, INC. August 4, 2006

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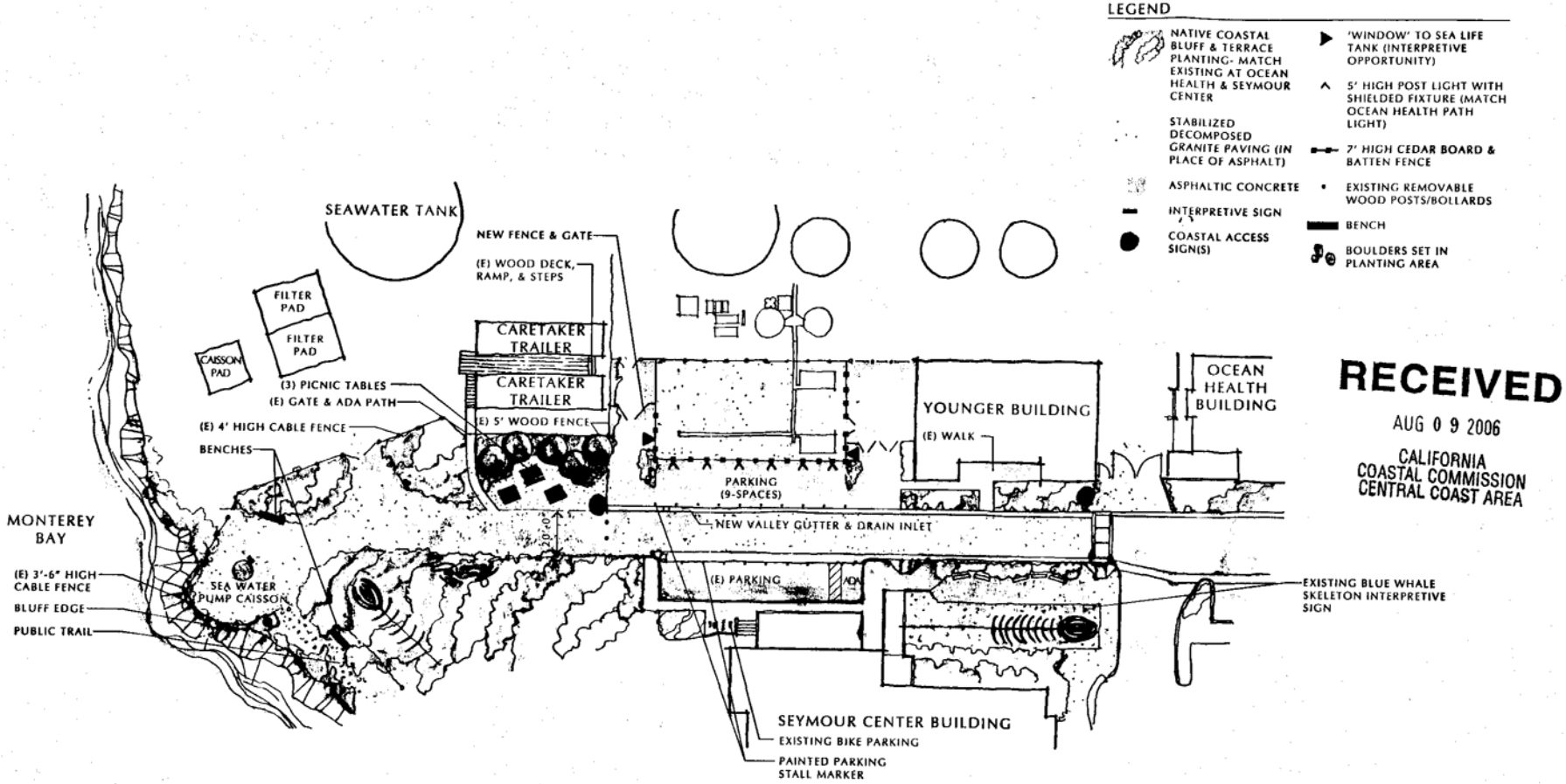

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PHASE 2 - CLRDP NOID No. 1
University of California, Santa Cruz
City of Santa Cruz
Long Marine Lab Public Access & Pilot Study

CONCEPTUAL PLAN | PREPARED BY: JONI L. JANECKI & ASSOCIATES, INC. August 6, 2006

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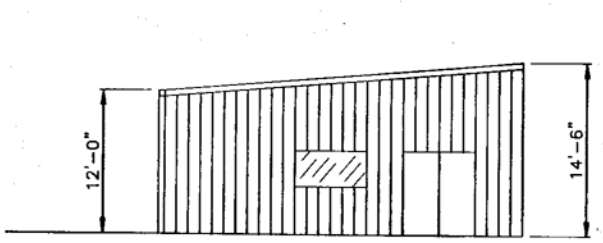
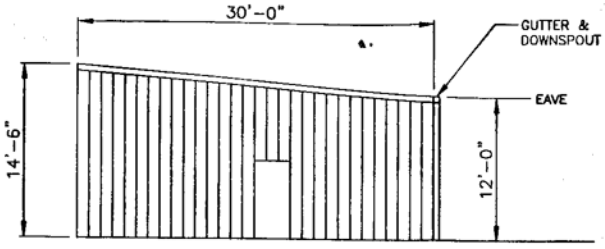
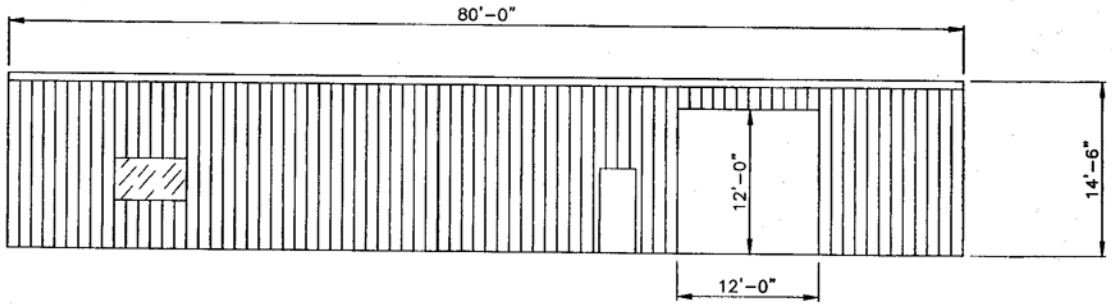


PILOT PLANT SIDE VIEW
(LOOKING NORTH)



PILOT PLANT SIDE VIEW
(LOOKING SOUTH)



PILOT PLANT FRONT VIEW
(LOOKING WEST)

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0 5 10
SCALE: 1" = 10'

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COASTAL COMMISSION
CENTRAL COAST AREA

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE:

CDM Camp Dresser & McKee Inc.

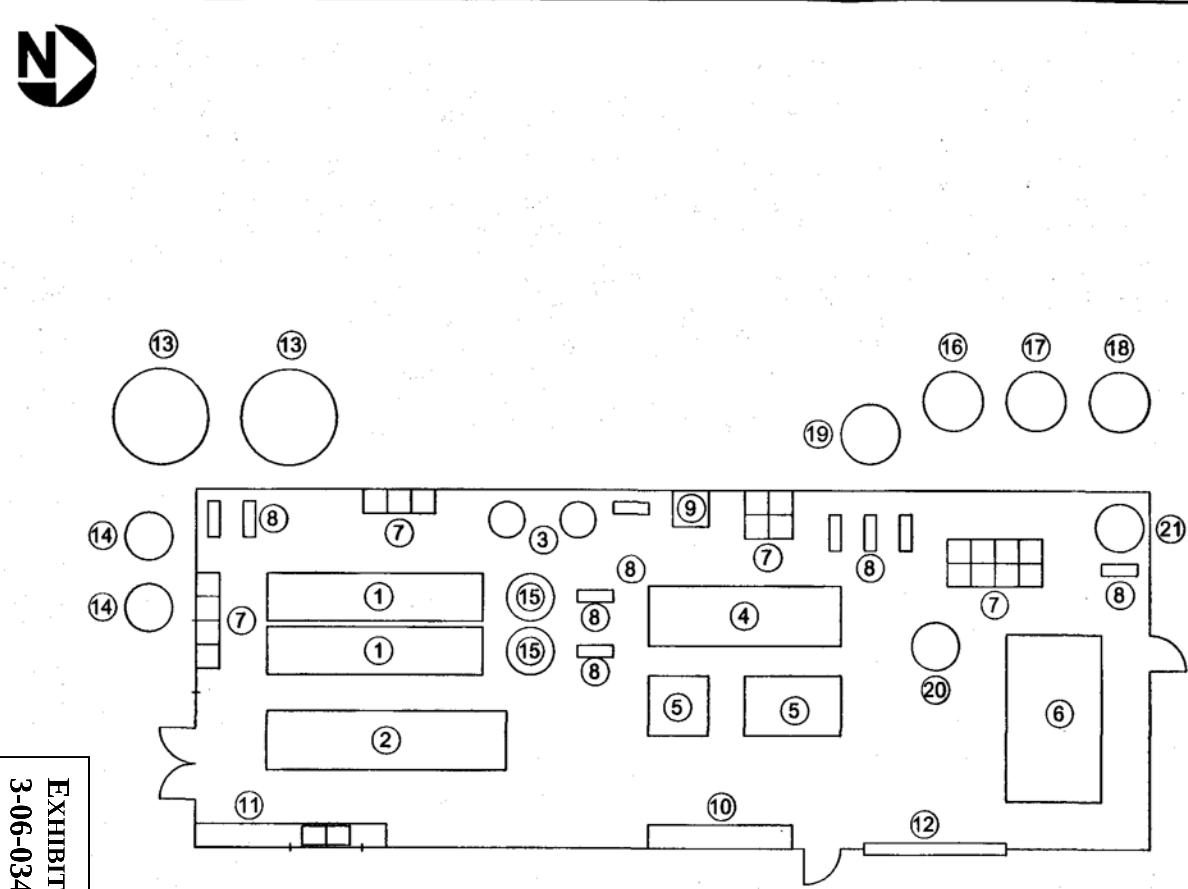
CITY OF SANTA CRUZ
SEWATER REVERSE OSMOSIS DESALINATION
PILOT TEST PROGRAM

PILOT BUILDING ELEVATIONS

PROJECT NO. 2281-19819
FILE NAME: SHEET-04

SHEET NO.
4 OF -

\\Wtserv1\esd\CAD2000\REV_05\ SHEET-04 03/24/06 14:26 nguyens XREFS: BORDER, BASE



SCALE: 1" = 10'

Legend

1. Flocculation/Sedimentation Process
2. Slow Sand Filter
3. Media Filters
4. Microfiltration System
5. Ultrafiltration System
6. SWRO Pilot Modules
7. Chemical Dosing Equipment
8. Pumps
9. Air Compressor
10. MCC/Power Distribution Panel
11. Counter with Sink
12. Roll Up Door
13. Raw Water Tanks (8'Øx10'H)
14. Treatment Residuals Tanks (4'Øx10'H)
15. Clarified Water Tanks (4'Øx6 1/2'H)
16. Filtered Water Tank - Media Filter (5'Øx11'H)
17. Filtered Water Tank - MF (5'Øx7 1/2'H)
18. Filtered Water Tank - UF (5'Øx7 1/2'H)
19. Permeate/Concentrate Blending Tank (5'Øx11'H)
20. Permeate Tank (4'Øx6 1/2'H)
21. RO Cleaning Tank (4'Øx6 1/2'H)

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CENTRAL COAST AREA

EXHIBIT #3
3-06-034
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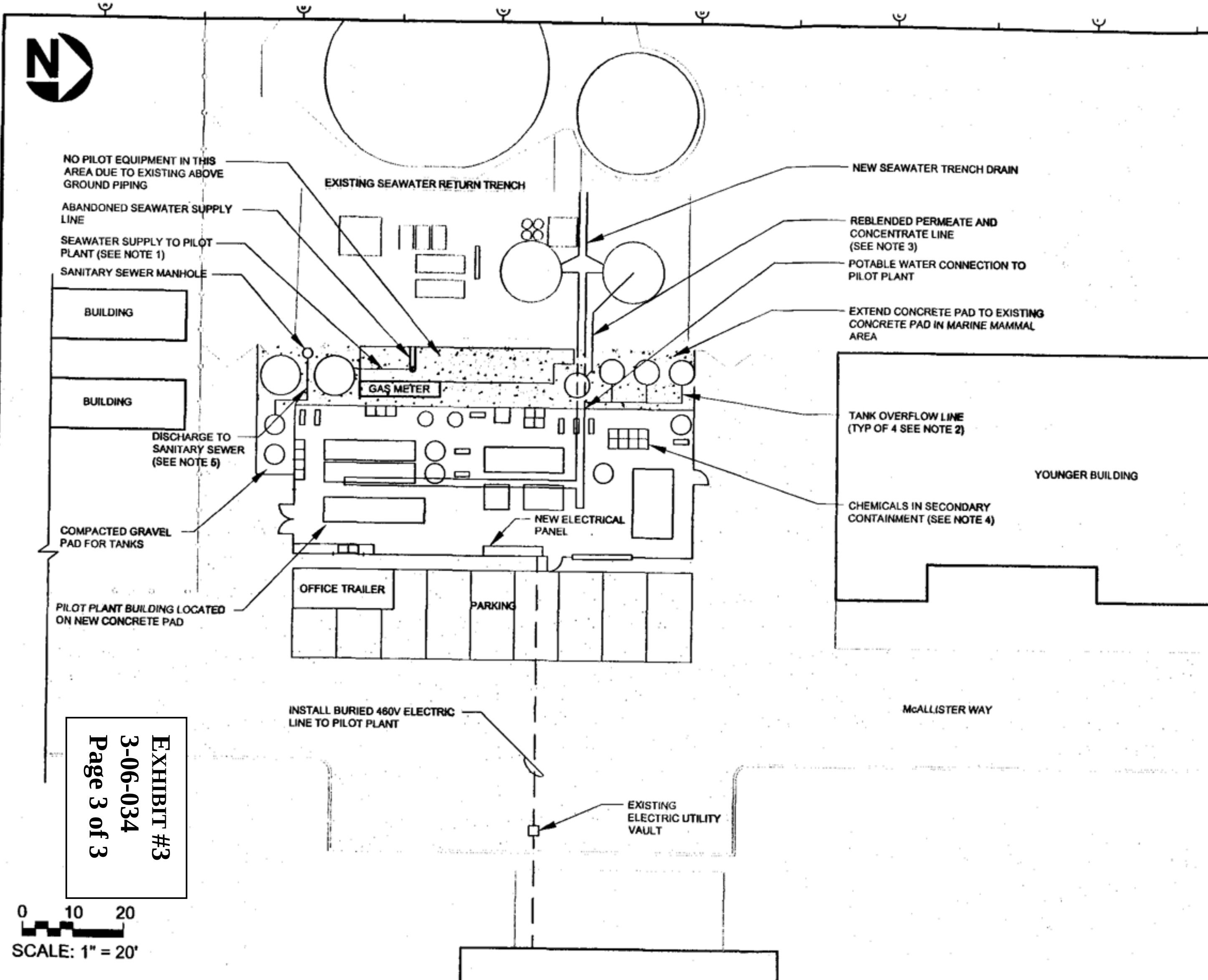
REV. NO.	DATE	DRWN	CHKD	REMARKS	DESIGNED BY: / DRAWN BY: / SHEET CHK'D BY: / CROSS CHK'D BY: / APPROVED BY: / DATE:	CDM Camp Dresser & McKee Inc.	CITY OF SANTA CRUZ SEWATER REVERSE OSMOSIS DESALINATION PILOT TEST PROGRAM	PILOT PLANT EQUIPMENT LAYOUT	PROJECT NO. 2281-49819 FILE NAME: SHEET-03 SHEET NO. 3 OF -

\\Wcsvr1\ccd\ACAD2000\REV_05\ SHEET-03 03/24/06 14:56 nguyena XREFS: BORDER, BASE



NOTES:

1. APPROXIMATELY 50 GPM OF SEAWATER WILL BE DIVERTED FROM LONG MARINE LAB'S INTAKE PUMP STATION. THE SEAWATER WILL BE TRANSFERRED TO THE PILOT PLANT VIA THE EXISTING ABANDONED SEAWATER SUPPLY LINE.

2. ALL FILTERED SEAWATER TANKS WILL OVERFLOW TO LONG MARINE LAB'S SEAWATER RETURN TRENCH. THE FILTERED WATER WILL NOT CONTAIN HAZARDOUS CHEMICALS.

3. THE CONCENTRATE AND PERMEATE FROM THE SEAWATER REVERSE OSMOSIS (SWRO) PROCESS WILL BE COMBINED IN THE PERMEATE/CONCENTRATE TANK. THE REBLENDED RO PERMEATE AND CONCENTRATE WILL BE PUMPED TO THE FILTERED WATER STORAGE TANK. THE BLENDED CONCENTRATE AND PERMEATE WILL NOT CONTAIN HAZARDOUS CHEMICALS.

4. ALL ON-SITE CHEMICALS WILL BE STORED IN DOUBLE CONTAINMENT TANKS WITHIN THE PILOT PLANT BUILDING. THE BULDING WILL REMAIN LOCKED WHEN UNATTENDED.

5. ALL TREATMENT RESIDUALS WILL BE DISCHARGED TO SANITARY SEWER. WASTE RESIDUALS DISCHARGE QUALITY: pH 6-9; AVERAGE SOLIDS MASS 10 LB/DAY; MAXIMUM SOLIDS CONCENTRATION 1,000 MG/L.

6. ALL STORAGE TANKS ARE LESS THAN 12 FEET IN HEIGHT.

7. LAB SINK DRAIN PUMPED TO WASTE RESIDUALS TANK.

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CROSS CHK'D BY:
APPROVED BY:
DATE:

CDM Camp Dresser & McKee Inc.

CITY OF SANTA CRUZ
SEWATER REVERSE OSMOSIS DESALINATION
PILOT TEST PROGRAM

SITE LAYOUT DURING PILOT STUDY

PROJECT NO. 2281-49818
FILE NAME: SHEET-01
SHEET NO. 1 OF –

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Location Map

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Current Site Use

N

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