MINUTE ITEM
This Calendar Item No. 57
was approved as Minute Item
No. 57 by the State Lands
Commission by a vote of 3
to 0 at its 5/5/95
meeting.

MINUTE ITEM 57

W 24777

PRC 7633

S. SEKELSKY

APPROVE A GENERAL PERMIT — PUBLIC AGENCY USE, A MEMORANDUM OF AGREEMENT FOR DUST MITIGATION ON OWENS LAKE, A JOINT POWERS AGREEMENT AND RELEASE OF FUNDS

Three letters were submitted into the record from Department of Water and Power, Los Angeles, CA; Keeler Community Service District, Keeler, CA; and California Department of Fish and Game, Bishop, CA, in regards to the proposed Negative Declaration.

After a brief discussion Calendar Item 57 was approved 3-0.

A 34

S 15

CALENDAR PAGE
MINUTE PAGE 1585

STATE OF CALIFORNIA

PETE WILSON, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer

May 4, 1992

File Ref.: W 24777

Mr. Dennis C. Williams
Engineer in Charge
Department of Water and Power
Los Angeles Aqueduct Division
Box 111
Los Angeles, California 90051-0100

Dear Mr. Williams:

We wish to thank you for your comments on the proposed Negative Declaration for the Owens Lake projects. We appreciate the time spent on this project and the nature of the comments.

We have made the editorial changes you suggested, including the substitution of "mitigation" for "bioremediation", the inclusion of "recorded" in the air quality section and "project" in the mitigation section, and the introductory material you submitted for the history section.

The Mill Site pump station will require electrical power to be brought to the site. Existing power lines run along Highway 136, but a line will have to be run for 1/3 of a mile to the pump site. The impacts, if any, of this line are being addressed by the BLM, since the line crosses their land.

The threshold velocity of 10 mph for blowing sand comes from the December, 1991, report prepared by AeroEnvironment Inc., for the Los Angeles Department of Water and Power, page 2-4, paragraph 3.

The values for water flows in the Owens Valley were taken from the Negative Declaration prepared by the Great Basin Unified Air Pollution Control District for their State Implementation Plan, done in December, 1988. This document includes a hydrology report prepared by the Department of Water and Power in October of the same year.

The issue of the permanence of the wetlands created by the pilot project is complicated by our lack of knowledge of which method or methods will be chosen for the final mitigation of the Owens Lake dust problem. If the various flooding pilot projects prove to be the most efficient system of reducing dust, then the wetlands created during the pilot may become permanent. If the other methods prove more efficient, then the fate of the wetlands is less certain.

Again, we appreciate the comments you prepared on this program, and your continuing involvement in the solution to the dust problems in the Owens Valley.

Sincerely,

Dwight E. Sanders
Chief, Division of Environmental
Planning and Management

File 24777
Copy

Department of Water and Power the City of Los Angeles

April 24, 1992

Mr. Goodyear K. Walker
California State Lands Commission
Division of Environmental Planning and Management
1807 13th Street
Sacramento, California 95814

Dear Mr. Walker:

Proposed Negative Declaration for Owens Lake Projects

This letter is in response to the Notice of Public Review of a Proposed Negative Declaration, dated March 27, 1992. The Negative Declaration addresses the potential impacts which may result from implementing the Proposed Dust Mitigation Pilot Program - Owens Lake. Our comments are enclosed.

If you have any questions regarding the comments, please contact Mr. David F. Allen at (213) 482-7412.

Sincerely,

Dennis C. Williams

DENNIS C. WILLIAMS
Engineer in Charge
Los Angeles Aqueduct Division

Enclosure

c: Mr. David F. Allen

111 North Hope Street, Los Angeles, California 90012 Mailing address: Box 111, Los Angeles 90051-0100
Telephone (213) 481-4211 Cable address: DEWAPOLA FAX (213) 481-8701

Comments on the Proposed Negative Declaration
for Owens (Dry) Lake Projects to be
Conducted during the 1992-93 Fiscal Year

Prepared by the City of Los Angeles
Department of Water and Power

General Comments

The State Implementation Plan (SIP) which was submitted by the Great Basin Unified Air Pollution Control District outlines a Dust Mitigation Plan and not a Dust Bioremediation Plan. Such references to bioremediation may limit the types of mitigation measures which may be utilized in the future. It is acceptable to use the term bioremediation so long as it applies to a specific project but the term should not be used when referring to potential mitigation measures, the SIP, or the Long Range Plan to control the fugitive dust emissions from Owens Lake.

The section that describes the environmental setting of vegetation contains excellent references, however the remaining sections within the environmental setting do not contain any references. Sources of information should be cited whenever values are stated or figures are used. This is particularly important for the environmental setting of water and the amounts of water entering and leaving the Owens Lake system. Whether or not these values are correct is questionable and if these values are known then some of the proposed studies are unnecessary.

It is extremely important to emphasize that the wetlands project is a temporary project and will be removed after completion of the test. By creating wetlands, the lands may become subject to the jurisdictional authority of the US Army Corps of Engineers even though these would be artificially created wetlands.

Detailed Comments

Additions are in **boldface** type and deletions are ~~stricken~~.

PROPOSED DUST REMEDIATION PILOT PROGRAM FOR OWENS LAKE

Initial Study -- Introduction

No comments.

Detailed Project Description

(Throughout each component of the project description, all references to **bioremediation** should be changed to **mitigation** since the underlying intent is to control fugitive dust emissions. The term "bioremediation" should only be used if it is applicable to a specific project.)

(page 1, para. 3, line 9)
... monitoring has verified that the highest recorded PM_{10} readings in ...

(page 2, para. 2, lines 8-10)
(A State Implementation Plan (SIP) for the Owens Valley has already been adopted by the California Air Resources Board.)

Component 1 - Wetlands Project
(page 3, para. 4, line 2)
A pump station will be constructed ...

It is not clear as to the source of power for the pump station (i.e. electrical or diesel). Currently there does not exist an electrical power source for the proposed Mill Site pump station. Supplying an electrical power source to this pump station would require installing a transmission line and power poles across a parcel of land which is managed by the US Bureau of Land Management (BLM). The entire Negative Declaration fails to address this issue. Such a construction process will require the issuance of a permit from BLM.

Potential Impacts and Mitigations Incorporated Into The Program

(This section does not include nor mention the potential impacts due to the construction of a pump at the Mill Site or the impacts associated with supplying the pump with a power source.)

(page 10, para. 1, line 2)
... crews, maintenance over the life of the pilot project, and investigators ...

Environmental Setting

(page 12, para. 4) - Add the following sentence at the beginning of the paragraph. -

Use of the Owens River water for agriculture in the Owens Valley and variation in annual precipitation caused the level of Owens Lake to drop considerably by the turn of the century. In ~~1917~~ 1913, the City of Los Angeles ...

PAGE ___
PAGE 1040

Climate

(page 15, para. 1, line 9)

... important threshold velocity for surface winds is ~~10~~ 18 mph.
(The source of reference should be cited.)

Water

(page 16, para. 1-4)

(All values listed within these paragraphs should be referenced.)

(page 16, para. 6, line 2)

... flowing intermittently and others flowing ~~permanently~~ **continuously.**

Environmental Impact Assessment Checklist
Discussion of Environmental Evaluation

C. Water

(page 26, C1., line 3)

... temporary ponds or wetlands on the lakebed **which will dry up at the completion of the test.**

D. Plant Life

(page 27, D1., last line)

... minimize any vegetation disturbance. **The creation of wetlands or ponds, referred to in C1. above, may encourage growth of new vegetation in or near the ponds. The new vegetation will die off when the ponds dry up at the conclusion of the test.**

E. Animal Life

(page 28, E1., last line)

... encountered while in the field. **The creation of wetlands or ponds, referred to in C1. above, may provide new wildlife habitat area. The new wildlife habitat area will be eliminated when the ponds dry up at the conclusion of the test.**

STATE OF CALIFORNIA

PETE WILSON *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer

May 4, 1992

File Ref.: W 24777

Richard M. Lopez, Chairman
Board of Directors
Keeler Community Service District
P.O. Box 63
Keeler, California 93530

Dear Mr. Lopez:

The staff of the State Lands Commission has reviewed the two letters you sent in response to its circulation of the proposed Negative Declaration for the Dust Remediation Program at Owens Lake. We appreciate the time you have taken to review and comment on the program and its components. Our responses are organized to correspond to the order of your comments.

The well located closest to Keeler's production well will not be used for pumping purposes, only for monitoring. This will help our staff ensure that no changes to the amount or quality of Keeler's water supply are taking place during this test.

This is a pilot project that will test dust control methodologies which have not been applied previously. We do not know for certain that any of these effects will take place, so the "maybe" response is appropriate. One of the major goals of this program is to verify the extent of the impacts that could be generated by different mitigations if they were implemented on a larger scale. Until the tests are made we will only have approximate answers.

We do not believe that any of these impacts will occur, but the purpose of the small scale pilot is to prove that this is the case. If there are significant adverse impacts, the project will cease immediately.

The pumps will be working intermittently over the course of one year. The volume of water pumped will vary with each episode to test a range of water volumes and its effect on the blowing dust and sand. The wells have been tested, pumping for 24 hrs/day for three full months at 1500 gpm x 3 wells, or 4500 gpm.

As the monitoring data is developed over the course of the pilot project, it will be shared with the Community Service Board and any other interested parties. It should be stated again that the purpose of the extensive monitoring is to detect any changes in the subsurface water supply early enough to stop any phase of the program that appears to be threatening those supplies.

The net effect of this project will be to increase the wetland area in and around Owens Lake. This increase may be temporary if the flooding mitigation is not adopted on a permanent basis, but there will be no decrease in the existing wetlands in any event.

Although we received your second letter after the public review period had ended, staff wishes to respond to those comments as well. Because of the mitigations and monitoring included in the pilot program, staff concludes that there will not be any significant impacts on any portion of the environment, including the local water supplies. Therefore, a Negative Declaration is the appropriate environmental document. When the data from these small pilot projects is available, and a full-scale dust mitigation project proposed, it will be appropriate to produce additional environmental documentation.

Thank you again for your interest and concerns.

Sincerely,

Dwight E. Sanders

Dwight E. Sanders
Chief, Division of Environmental
Planning and Management

File W24777

KEELER COMMUNITY SERVICE DISTRICT

POST OFFICE BOX 63
KEELER, CALIFORNIA 93530

April 27, 1992

GOODYEAR K. WALKER
Division of Environmental
Planning and Management
State Lands Commission
1807 - 13th Street
Sacramento, CA 95814

Re: Comments - Negative Declaration - Proposed Dust Remediation Pilot Program - Owens Lake

Dear Mr. Walker:

The Keeler Community Service District Board of Directors have the following comments regarding the above project:

1) We hereby formally request that the test well of the Great Basin Unified Air Pollution Control District, located approximately one mile from our production well for the town of Keeler, not be used in any proposed projects on Owens Dry Lake, because of the likelihood that pumping from the test well would draw down our aquifer, and/or reduce or negatively affect the quantity and quality of Keeler's water supply. Similarly, we wish to go on record as opposing any other type of pumping from nearby areas which would negatively affect our water supply.

2) A general comment on the "Environmental Impact Assessment Checklist - Part II" is that it does not include any "Yes" responses; only "Maybe" or "No" responses. Therefore it would seem unnecessarily vague in its required assessment of the expected impacts.

3) We are concerned about items 6, 7 and 8 on page two of the checklist, which are all answered with a "Maybe":
6. "Alteration of the direction or rate of flow of groundwaters";
7. "Change in the quantity of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations"; and
8. "Substantial reduction in the amount of water otherwise available for public water supplies".

4) Apparently, Keeler lies in the middle of the areas to the north and the south which will involve pumping and formation of wetland areas. We note that you plan to use 10" pipes for water transport. The Negative Declaration document does not identify the volume of water which will be pumped from each area, nor the length of time of the pumping. Again, our concern is that large scale pumping will negatively affect our town water supply. We request that our Board be advised of

the volume and length of time of pumping which will be undertaken at the two pumping stations, and

5) We request that you work closely with our Board in your monitoring of water levels in these areas as well as at our Keeler well so that our town water supply is not threatened in any way when you begin your pumping program.

5) Keeler residents, along with the KCSD Board members, have expressed concerns regarding safeguarding existing local wetland areas; for example, the wildfowl habitat about a mile northwest of Keeler, and those along the lakebed edge south of Keeler. There are many existing wetland areas on Owens Lake, which should be documented and protected.

We would be happy to discuss the above with you or members of your staff. I can be reached at (619)876-4238 or (619)876-4633 (evenings); or you can contact our Secretary at (619)876-4777.

Very truly yours,

Richard M. Lopez

RICHARD M. LOPEZ
Chairman
Board of Directors

cc: Senator Bill Leonard
400 N. Mountain Ave., Suite 109
Upland, CA 91786

Inyo County Board of Supervisors
P.O. Drawer N
Independence, CA 93526

Robert Kennedy, Director
Inyo County Environmental Health Dept.
P.O. Box 427
Independence, CA 93526

Ellen Hardebeck, Director
Great Basin Unified Air Pollution Control District
157 Short St., Suite 6
Bishop, CA 93514

Wayne Lemieux
Attorney at Law
200 N. Westlake Blvd., Suite 102
Westlake Village, CA 91362-3755

File 24777

Not received until 4-30-92

KEELER COMMUNITY SERVICE DISTRICT

POST OFFICE BOX 63
KEELER, CALIFORNIA 93530

April 29, 1992

GOODYEAR K. WALKER
Division of Environmental
Planning and Management
State Lands Commission
1807 - 13th Street
Sacramento, CA 95814

Re: Further Comments - Negative Declaration - Proposed Dust Remediation Pilot Program - Owens Lake

Dear Mr. Walker:

The Keeler Community Service District Board of Directors have the following further comments regarding the above project, in addition to those concerns outlined in my letter to you dated April 27, 1992:

We believe an Environmental Impact Report is necessary for this work. We do not feel that it is appropriate for this project to be broken down into increments, and Negative Declarations prepared for each section of the project. Instead, an Environmental Impact Report should be prepared for the entire project, including this Pilot Program. We do not feel that a Negative Declaration will provide the necessary review and protections required for a project of this scope, particularly in light of the anticipated impacts on local water supplies.

Please contact me at (619)876-4238, (619)876-4633 (evenings), or the Board Secretary at (619)876-4777 if you have any questions.

Sincerely,

Richard M. Lopez

RICHARD M. LOPEZ
Chairman
Board of Directors

STATE OF CALIFORNIA

PETE WILSON, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95

CHARLES WARREN
Executive Officer

May 4, 1992

File Ref.: W 24777

Denyse Racine
Wildlife Biologist
California Department of Fish and Game
407 W. Line Street
Bishop, California 93514

Dear Ms. Racine;

We appreciate your continued involvement with the proposed dust mitigation pilot projects for the Owens Valley, and the comments which we received from you on our proposed Negative Declaration.

We will be adding to the final document wording to incorporate your suggestions. Component 1 will be modified to include monitoring of the effects of pumping on springflow, and on the wetland vegetation associated with those springs. The contractor for the vegetation portion of this component will be advised to consult with both you and our own biologist when selecting test species for the test plots. The mitigation section has been modified to add the fact that all plant surveys must be conducted at the most appropriate time of year to ensure the highest probability to identify these plants. The sentence you suggested regarding notification of Fish and Game and the California Natural Diversity Data Base has also been added.

It is our intent to keep you informed of the progress of the various components of the pilot program, and to involve you in the process of designing a final dust mitigation plan for which additional environmental documentation will be prepared.

Again, thank you for the time you have spent with us on this project, and for the comments you submitted.

Sincerely,

Dwight E. Sanders
Chief, Division of Environmental
Planning and Management

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON Governor

DEPARTMENT OF FISH AND GAME
407 W. Line Street
Bishop, CA 93514
(619) 872-1171

April 29, 1992

State Lands Commission
Executive Office
1807 13th Street
Sacramento, CA 95814
Attention: Goodyear K. Walker

Dear Mr. Walker,

The Department of Fish and Game has reviewed the Negative Declaration for the Proposed Dust Remediation Pilot Program-Owens Lake, SCH No. 92032104, located in Inyo County. The project consists of a pilot program to reduce dust emissions from the bed of Owens Lake, consisting of nine components. We have the following comments for your consideration:

1) Page 3, paragraph 2. Objective 6 should be expanded to include documentation of the effects that pumping has on springflow and associated wetland vegetation.

2) Page 4, paragraph 3. As the state trustee agency for fish and wildlife resources (including plants), we request that the Department be given the opportunity to provide input on the selection of plant species and planting techniques to be used on the test sites. We support the use of native species only for the test plots.

3) Page 10, paragraph 3. The document should state that the rare plant surveys must be conducted during the appropriate time of year (generally when the plants are flowering) to detect the presence of the target species.

4) Page 10, Potential Impacts and Mitigations Incorporated into the Program. We request that this section be expanded to include the following sentence: "If, during the course of the biological survey work being conducted for this project, any occurrence of any sensitive plant or animal is discovered, the Bishop office of the Department of Fish and Game shall be notified as soon as possible following the discovery. The California Natural Diversity Data Base will also be notified at the end of the survey period of all sensitive species noted during the project."

5) Page 11. We support the various mitigation measures which have been incorporated into the project to minimize disturbance to western snowy plover nesting areas.

Thank you for the opportunity to comment on this document. If you have any questions, please call me at the above telephone number.

Sincerely,

Denyse Racine

Denyse Racine
Associate Wildlife Biologist

CALENDAR ITEM

A 34
S 15

57

05/05/92
W 24777 PRC 7633
S. Sekelsky

APPROVE A GENERAL PERMIT - PUBLIC AGENCY USE,
A MEMORANDUM OF AGREEMENT FOR DUST MITIGATION ON
OWENS LAKE, A JOINT POWERS ACREEMENT AND RELEASE OF FUNDS

APPLICANT:
Great Basin Unified Air Pollution
Control District (GBUAPCD)
157 Short Street, Suite 6
Bishop, California 93514

AREA, TYPE LAND AND LOCATION:
Approximately 13,960 acres of State-owned sovereign lands in the dry bed of Owens Lake, Inyo County.

LAND USE:
Mitigation and dust abatement projects to limit particulate pollution from the dry bed of Owens Lake.

TERMS OF PROPOSED PERMIT:
Initial period:
Three (3) years beginning May 1, 1992.

CONSIDERATION:
The public health and safety; with the State reserving the right at any time to set a monetary rental if the Commission finds such action to be in the State's best interest.

BASIS FOR CONSIDERATION:
Pursuant to 2 Cal. Code Regs. 2003.

APPLICANT STATUS:
Applicant has jurisdiction over the implementation of emission limitations, rules and regulations, and enforcement procedures to maintain State and federal ambient air quality standards in the Owens Valley basin.

PREREQUISITE CONDITIONS, FEES AND EXPENSES:
Filing fee has been received.

STATUTORY AND OTHER REFERENCES:
A. P.R.C.: Div. 6, Parts 1 and 2; Div. 13.

B. Cal. Code Regs.: Title 3, Div. 3; Title 14, Div. 6.

AB 884:
N/A

OTHER PERTINENT INFORMATION:
1. Until 1987, Owens Lake was exempted from meeting Federal Air pollution standards by the environmental Protection Agency (EPA) under their "Rural Fugitive Dust Policy". The exemption was removed in 1987 at the request of the local air pollution district, the Great Basin Unified Air Pollution Control District (GBUAPCD), because the lake and adjacent areas produced measured violations up to 12 times the new Federal Standard (PM-10) and because of the severe impact on the region during dust episodes.

   The EPA now requires that a comprehensive plan to control the dust from the Owens Lake area be developed by 1994 and that an air quality standard (PM-10) be met by the year 2001.

   If approved, the program would provide the GBUAPCD, in conjunction with the University of California, Davis; University of Nevada; Air Resources Board (ARB); and Los Angeles Department of Water and Power (LADWP), with the ability to implement a mitigation and dust abatement program to reduce the (PM-10) level. The program, as set forth in exhibits "C" and "D" consists of research and construction components that involve wetland development (controlled flooding), sand fences, dune arrays, water availability, and vegetation regeneration. Each of the components is a pilot or exploratory project. The final design of a dust mitigation strategy will use the scientific information developed by each of these pilot projects. The final dust mitigation plan will require additional environmental documentation and Commission action.

The entire four-year project is expected to cost $5,381,989, $300,000 of which is attributable to the UCD project components, and the remainder of $5,081,989 is attributable to the GBUAPCD project components.

While the State Lands Commission staff is providing direct assistance in the areas of environmental and permit processing, the funding will be provided by approved legislation, U.C. Davis, LADWP, EPA, and ARB.

2. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Code Regs. 15025), the staff has prepared a Proposed Negative Declaration (ND) identified as EIR ND 587, State Clearinghouse No. 92032104. Such Proposed Negative Declaration was prepared and circulated for public review pursuant to the provisions of CEQA.

3. Subsequent to circulation of the ND, changes in the project description of one of the components of the proposed program, namely, the Sand Dune Array Mitigation Test (Component No. 2 - Proposed Negative Declaration), Exhibit "C", were made.

   The only change in this component is in the location. The original location for this component is shown on figures 3, 4, and 5 in Exhibit "C". The location of this component has been changed and will now occur in the southern part of the lakebed as shown in Exhibit "D". This proposed location has been addressed in the proposed Negative Declaration.

   All mitigation measures incorporated into the project description will also apply to the project at the new location. Staff of the Department of Fish and Game have been contacted regarding the change to the proposed program and have indicated that identified mitigation measures would avoid impacts to plants and animals.

4. A Mitigation Monitoring Plan has been prepared and is attached to the Proposed Negative Declaration. The

University of California, Davis, and the Great Basin Unified Air Pollution Control District are responsible for monitoring as specified in both the Proposed Negative Declaration and the Monitoring Plan.

5. Based upon the Initial Study, the Proposed Negative Declaration, and the comments received in response thereto. There is no substantial evidence that the program will have a significant effect on the environment. (14 Cal. Code Regs. 15074(b))

6. This activity involves lands which have not been identified as possessing significant environmental values pursuant to P.R.C. 6370, et seq.

7. The Memorandum of Agreement, Exhibit "E", describes the dust abatement and mitigation program and the areas in which the State Lands Commission and GBUAPCD will cooperate.

8. The Joint Power Agreement and fund release, Exhibit "F", sets forth the parameters for the transfer of funds between the State Lands Commission, GBUAPCD, and U. C. Davis.

EXHIBITS:

A. Land Description
B. Location Map
C. Negative Declaration/Monitoring Program
D. New Location Map - Component No. 2
E. Memorandum of Agreement
F. Joint Powers Agreement and Fund Release

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT A NEGATIVE DECLARATION, EIR ND 587, STATE CLEARINGHOUSE NO. 92032104, WAS PREPARED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.

2. DETERMINE THAT THE PROJECT, AS APPROVED, WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT.

3. ADOPT THE MITIGATION MONITORING PLAN ATTACHED AS EXHIBIT "C".

4. AUTHORIZE THE EXECUTIVE OFFICER, OR HIS DESIGNEE, TO ENTER INTO AND EXECUTE A MEMORANDUM OF AGREEMENT AND A JOINT POWER AGREEMENT BETWEEN THE STATE LANDS COMMISSION AND GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUBSTANTIALLY THE FORM ATTACHED AS EXHIBITS "E" AND "F".

EXHIBIT A

All that portion of the following described lands lying waterward of the U.S. meander line of Owens Lake, Inyo County.

T. 16 S., R. 36 E., M.D.B. & M.

Projected Sections 13, 23, 24, 25, 26, 35 & 36

T. 16 S., R. 37 E., M.D.B. & M.

Projected Sections 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 & 36

T. 17 S. R. 37 E., M.D.B. & M.

Projected Sections 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 24, 25, 35 & 36

T. 17 S., R. 38 E., M.D.B. & M.

Projection Sections 4, 5, 6, 7, 8, 9, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32 & 33

T. 18 S., R. 37 E., M.D.B. & M.

Projected Sections 1, 2, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, & 34

T. 18 S., R. 38 E., M.D.B. & M.

Projected Sections 5, 6, 7, 8, 18 & 19

T. 19 S., R. 37 E., M.D.B. & M.

Projected Sections 4, 5 & 6

Excepting all lands not under the jurisdiction of or presently under lease with State Lands Commission.

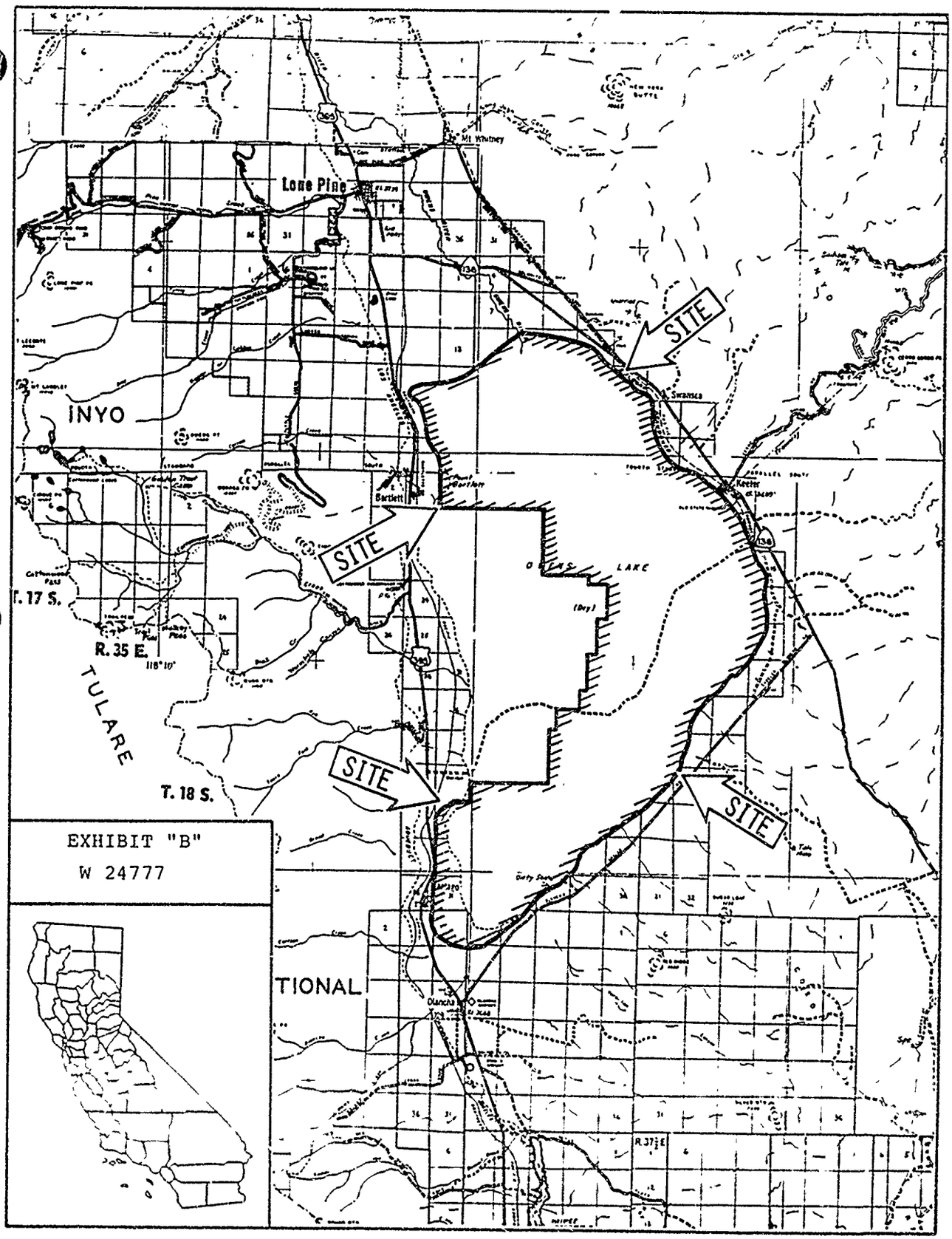


EXHIBIT "B"
W 24777

CALENDAR PAGE 339. 6
MINUTE PAGE 1055

EXHIBIT C

STATE OF CALIFORNIA — PETE WILSON, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer

March 27, 1992
File: W 24777
ND 587

NOTICE OF PUBLIC REVIEW OF A PROPOSED NEGATIVE DECLARATION (SECTION 15073 CCR)

A Negative Declaration has been prepared pursuant to the requirements of the California Environmental Quality Act (Section 21000 et seq., Public Resources Code), the State CEQA guidelines (Section 15000 et seq., Title 14, California Code Regulations), and the State Lands Commission Regulations (Section 2901 et seq., Title 2, California Code Regulations) for a project currently being processed by the staff of the State Lands Commission.

The document is attached for your review. Comments should be addressed to the State Lands Commission office shown above with attention to the undersigned. All comments must be received by April 29, 1992.

Should you have any questions or need additional information, please call the undersigned at (916) 322-0530.

GOODYEAR K. WALKER
Division of Environmental
Planning and Management

Attachment

STATE OF CALIFORNIA

PETE WILSON *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer

PROPOSED NEGATIVE DECLARATION

File: W 24777
ND 587
SCH No. 92032104

Project Title:	Proposed Dust Remediation Pilot Program -- Owens Lake
Proponent:	State Lands Commission
Project Location:	Owens Lake, Inyo County
Project Description:	Pilot program to reduce dust emissions from the bed of Owens Lake, consisting of nine components.
Contact Person:	Goodyear K. Walker Telephone: 916/322-0530

This document is prepared pursuant to the requirements of the California Environmental Quality Act (Section 21000 et seq., Public Resources Code), the State CEQA Guidelines (Section 15000 et seq., Title 14, California Code Regulations), and the State Lands Commission regulations (Section 2901 et seq., Title 2, California Code Regulations).

Based upon the attached Initial Study, it has been found that:

/__/ this project will not have a significant effect on the environment.

/X/ mitigation measures included in the project will avoid potentially significant effects.

STATE LANDS COMMISSION

ENVIRONMENTAL IMPACT ASSESSMENT CHECKLIST – PART II

Form 13.20 (7/82)

File Ref.: W24777

I. BACKGROUND INFORMATION

A Applicant: State Lands Commission
1807 13th Street
Sacramento, CA 95814

B. Checklist Date: 3 / 26 / 92

C Contact Person: G. K. Walker

Telephone: (916) 322-0530

D Purpose: Pilot program to reduce dust emissions from Owens Dry Lake bed.

E Location: Owens Dry Lake – Inyo County

F Description: Pilot program to test nine components in order to study possible dust bioremediation strategies and their possible effects on the environment.

G Persons Contacted:
Great Basin Unified APCD – Ellen Hardebeck
University of California – Davis – Thomas A. Cahill
California Dept. of Fish and Game (Bishop Branch Office) Denise Racine

II ENVIRONMENTAL IMPACTS. *(Explain all "yes" and "maybe" answers)*

A *Earth* Will the proposal result in.

	Yes	Maybe	No
1 Unstable earth conditions or changes in geologic substructures?	☐	☐	X
2 Disruptions, displacements, compaction, or overcovering of the soil?	☐	X	☐
3 Change in topography or ground surface relief features?	☐	X	☐
4 The destruction, covering, or modification of any unique geologic or physical features?	☐	☐	☐
5 Any increase in wind or water erosion of soils, either on or off the site?	☐	X	☐
6 Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet, or lake?	☐	☐	X
7 Exposure of all people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?	☐	☐	X

	Yes	Maybe	No
B *Air.* Will the proposal result in:			
1. Substantial air emmissions or deterioration of ambient air quality?	☐	☒	☐
2. The creation of objectionable odors?	☐	☐	☒
3. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?	☐	☐	☒
C. *Water.* Will the proposal result in:			
1. Changes in the currents, or the course or direction of water movements, in either marine or fresh waters?	☐	☒	☐
2. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?	☐	☐	☒
3. Alterations to the course or flow of flood waters?	☐	☐	☒
4. Change in the amount of surface water in any water body?	☐	☐	☒
5. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?	☐	☐	☒
6. Alteration of the direction or rate of flow of ground waters?	☐	☒	☐
7. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	☐	☒	☐
8. Substantial reduction in the amount of water otherwise available for public water supplies?	☐	☒	☐
9. Exposure of people or property to water-related hazards such as flooding or tidal waves?	☐	☐	☒
10. Significant changes in the temperature, flow or chemical content of surface thermal springs?	☐	☐	☒
D. *Plant Life.* Will the proposal result in:			
1. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)?	☐	☒	☐
2. Reduction of the numbers of any unique, rare or endangered species of plants?	☐	☒	☐
3. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	☐	☒	☐
4. Reduction in acreage of any agricultural crop?	☐	☐	☒
E *Animal Life* Will the proposal result in:			
1. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, or insects)?	☐	☒	☐
2. Reduction of the numbers of any unique, rare or endangered species of animals?	☐	☒	☐
3. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	☐	☐	☒
4. Deterioration to existing fish or wildlife habitat?	☐	☒	☐
F *Noise.* Will the proposal result in:			
1. Increase in existing noise levels?	☐	☒	☐
2. Exposure of people to severe noise levels?	☐	☐	☒
G. *Light and Glare* Will the proposal result in:			
1. The production of new light or glare?	☐	☐	☒
H *Land Use* Will the proposal result in			
1. A substantial alteration of the present or planned land use of an area?	☐	☐	☒
I *Natural Resources* Will the proposal result in			
1. Increase in the rate of use of any natural resources?	☐	☒	☐
2. Substantial depletion of any nonrenewable resources?	☐	☐	☒

		Yes	Maybe	No
J	*Risk of Upset* Does the proposal result in			
	1. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation) in the event of an accident or upset conditions?	☐	☐	☒
	2 Possible interference with emergency response plan or an emergency evacuation plan?	☐	☐	☒
K.	*Population* Will the proposal result in.			
	1 The alteration, distribution, density, or growth rate of the human population of the area?	☐	☐	☒
L.	*Housing.* Will the proposal result in:			
	1. Affecting existing housing, or create a demand for additional housing?	☐	☐	☒
M.	*Transportation/Circulation.* Will the proposal result in.			
	1. Generation of substantial additional vehicular movement?	☐	☐	☒
	2. Affecting existing parking facilities, or create a demand for new parking?	☐	☐	☒
	3. Substantial impact upon existing transportation systems?	☐	☐	☒
	4. Alterations to present patterns of circulation or movement of people and/or goods?	☐	☐	☒
	5. Alterations to waterborne, rail, or air traffic?	☐	☐	☒
	6. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?	☐	☐	☒
N	*Public Services* Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:			
	1. Fire protection?	☐	☐	☒
	2. Police protection?	☐	☐	☒
	3. Schools?	☐	☐	☒
	4. Parks and other recreational facilities?	☐	☐	☒
	5. Maintenance of public facilities, including roads?	☐	☐	☒
	6. Other governmental services?	☐	☐	☒
O.	*Energy.* Will the proposal result in:			
	1. Use of substantial amounts of fuel or energy?	☐	☐	☒
	2. Substantial increase in demand upon existing sources of energy, or require the development of new sources?	☐	☐	☒
P	*Utilities.* Will the proposal result in a need for new systems, or substantial alterations to the following utilities.			
	1. Power or natural gas?	☐	☐	☒
	2 Communication systems?	☐	☐	☒
	3. Water?	☐	☐	☒
	4. Sewer or septic tanks?	☐	☐	☒
	5. Storm water drainage?	☐	☐	☒
	6. Solid waste and disposal?	☐	☐	☒
Q	*Human Health* Will the proposal result in:			
	1 Creation of any health hazard or potential health hazard (excluding mental health)?	☐	☐	☒
	2 Exposure of people to potential health hazards?	☐	☐	☒
R	*Aesthetics* Will the proposal result in			
	1 The obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?	☐	☒	☐
S	*Recreation* Will the proposal result in			
	1 An impact upon the quality or quantity of existing recreational opportunities?	☐	☐	☒

	Yes	Maybe	No
T. *Cultural Resources.*			
1. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archeological site?	☐	☐	☒
2. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?	☐	☐	☒
3. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?	☐	☐	☒
4. Will the proposal restrict existing religious or sacred uses within the potential impact area?	☐	☐	☒
U. *Mandatory Findings of Significance.*			
1. Does the project have the potential to degrade the quality of the environment, reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒
2. Does the project have the potential to achieve short term, to the disadvantage of long-term, environmental goals?	☐	☐	☒
3. Does the project have impacts which are individually limited, but cumulatively considerable?	☐	☐	☒
4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒

III. DISCUSSION OF ENVIRONMENTAL EVALUATION *(See Comments Attached)*

IV. PRELIMINARY DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Date: / /

For the State Lands Commission

209.12

Form 1520 1/82

PROPOSED DUST REMEDIATION PILOT PROGRAM FOR OWENS LAKE

Initial Study -- Introduction

The California State Lands Commission (SLC) has prepared the following Initial Study to analyze components of a proposed pilot program to reduce dust emissions from the bed of Owens Lake. The bed of the Lake is under the jurisdiction of the State Lands Commission and the Commission is the Lead Agency for purposes of the California Environmental Quality Act (CEQA). This document is prepared pursuant to the requirements of the CEQA, Section 21000 et seq. of the Public Resources Code, the State CEQA Guidelines, Section 15000 et seq.of Title 14, California Code of Regulations, and the Commission's regulations, Section 2901 et seq.of Title 2, California Code of Regulations.

This Initial Study concludes that the program, as proposed, incorporates mitigation measures which will avoid potentially significant environmental impacts and that the program and its respective components will not have any significant impacts on the environment. A Negative Declaration is therefore appropriate under the provisions of Section 15070 (b) of the State CEQA Guidelines.

Detailed Project Description

In 1987, the Environmental Protection Agency (EPA) revised the National Ambient Air Quality Standards (NAAQS) for suspended particulate matter less than 10 microns in diameter (PM_{10}). This change was intended to measure and reduce the fraction of suspended particles in the air which is injurious to human health. Later in that same year, EPA identified the southern Owens Valley as one of the many areas in the nation which, based on air quality monitoring, would likely exceed the PM_{10} NAAQS. Subsequent monitoring has verified that the highest PM_{10} readings in California occur downwind of the dry bed of Owens Lake (See Figure 1). Consequently, the EPA has required the State of California to prepare a State Implementation Plan (SIP) to bring the southern Owens Valley into compliance with the NAAQS. The SIP, prepared by the Great Basin Unified Air Pollution Control District (GBUAPCD), identifies Owens Dry Lake as the major contributor to the violations of the PM_{10} NAAQS in the Valley. This SIP was approved by the California Air Resources Board in September of 1989 and again in 1992 and forwarded to EPA.

As a part of the SIP, the GBUAPCD has developed a Long Range Dust Bioremediation Plan (Plan) that lays out the goals and some possible approaches to mitigating the effects of area dust storms. The Plan identifies the need to understand the current lake bed ecosystem and relies on that understanding to develop and implement an overall dust reduction/bioremediation program to facilitate the

attainment of air quality standards. The SLC, as the major landowner in the area, and the GBUAPCD and other agencies are proposing this pilot program to study possible dust bioremediation strategies and their possible effects on the environment. The current program consists of nine components. Taken together, these components are designed to provide some of the necessary knowledge of the lake bed's surface and subsurface conditions, natural ecosystems and dust bioremediation strategies that will be used to decide on a comprehensive strategy to bring the Valley into compliance with EPA air quality standards.

Each of these program components is a pilot or exploratory project. The final design of a dust mitigation strategy will be based on the scientific information developed by each of these pilot projects. Upon review of the test data gathered under the proposed program, the decision on a final remediation plan will be made by the Owens Lake Technical Group which consists of staff from the GBUAPCD, the SLC and the University of California, Davis. GBUAPCD will have responsibility to develop and adopt a State Implementation Plan in conjunction with the State Air Resources Board and the U.S. Environmental Protection Agency. The final dust mitigation plan will require additional environmental documentation prior to its adoption and implementation. The pilot program is scheduled to begin in the 1992-93 fiscal year beginning in July, 1992 and is expected to take more than a year to complete.

The work proposed for each of these components is on a small scale, and requires no major construction operations. Initial construction or instrumentation for four of the components (1,2,3 and 7) will require some vehicular access to the lake bed. No more than five standard four-wheel drive vehicles will be used for this purpose at any one time. The conduct of the remaining components, as well as their on-going maintenance, will be done on foot or with a single vehicle. The existing network of roads or trails on the Lake bed will be used for most of the work. Any new access routes to specific sites will begin at the existing network.

The components of the proposed program are:

1. Wetlands Dust Bioremediation Test
2. Sand Dune Array Bioremediation Test
3. Shallow Groundwater Investigation
4. Deep Aquifer Investigation
5. Surface Water Investigation
6. Vegetation Research
7. Aeolian Transport Study
8. Physical Characterization of the Lake Bed
9. Pre-Bioremediation Engineering Studies

Component 1-Wetlands Dust Bioremediation Test

Dust emissions from moist, wet or ponded areas are very low to nonexistent. Long term pump tests, in excess of 90 days,were carried out in 1991. These tests provided water to areas of up to

two square miles of the Lake bed with relatively small flow rates. The purpose of this component is to determine the effectiveness and feasibility of using wetland development on a large scale to control dust at Owens Lake. Such a bioremediation strategy will reduce the PM_{10} levels and previous work indicates that affected areas will quickly return to pre-flooded conditions if this strategy is not adopted on a large scale. At a minimum, such a bioremediation project will enhance the wetland values of the Owens Lake area.

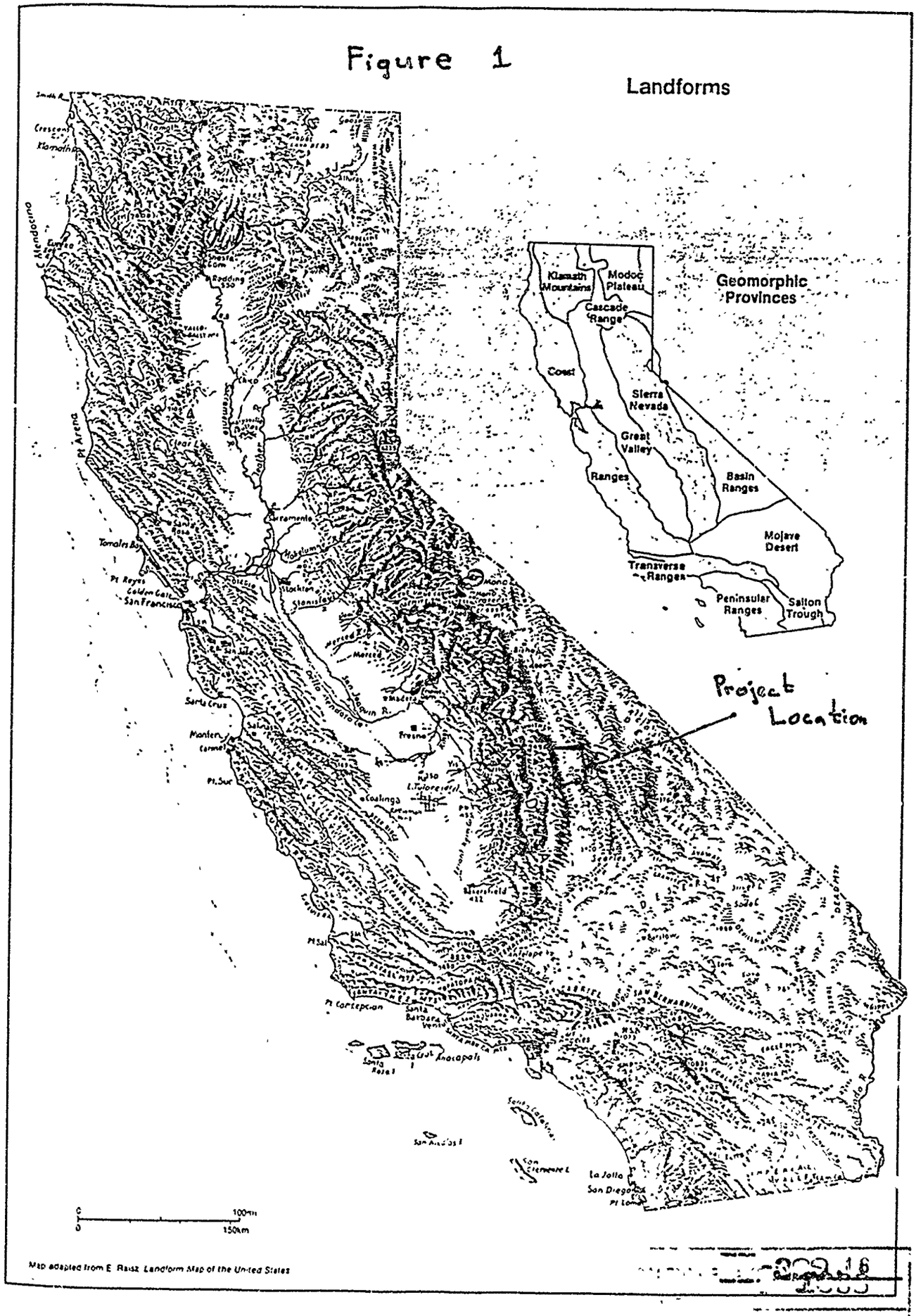
The objectives of this component are to: 1) determine the ability of wetlands to control fugitive dust emissions; 2) determine the most efficient technique of maintaining a non-emissive surface establishing wetlands with a minimum flow of water per acre; 3) determine the usefulness of wetlands in establishing vegetation directly on the lake bed; 4) determine the effect of wetlands on the surface and near surface soil chemistry; 5) evaluate the wildlife enhancement values of wetlands on the Lake bed; 6) document the effect that pumping has on the affected aquifer; and 7) evaluate the availability of water resources for expansion of the wetlands concept.

This strategy will be tested at two separate sites on the Lake bed, one in the northern, sand-dominated part of the Lake bed, and one in the southern, salt-efflorescent dust area (see Figures A-C). The test area will be divided into continuous and intermittent water flow areas at both sites . At the northern site three test areas will be tested with vegetation, and two without (see Figures 2 a-c). Water will be pumped from GBUAPCD's existing wells on the north and east shores of the Lake. Water for the northern test site will be transported from the two existing River Wells by an existing and proposed pump stations near the Owens River delta via 25,000 feet of 10-inch water line to the northeast shore. The southerly 8,000 feet of pipe will form the easterly boundary of the test area. The test area will extend from the pipeline out toward the center of the Lake. This test site is a known dust source at the northern end of a sand dominated area of very low relief (about 4 feet per thousand). The northern test site will be divided into five subsections, each of which can be flooded from the pipeline. The planned scenarios for each section is as follows:

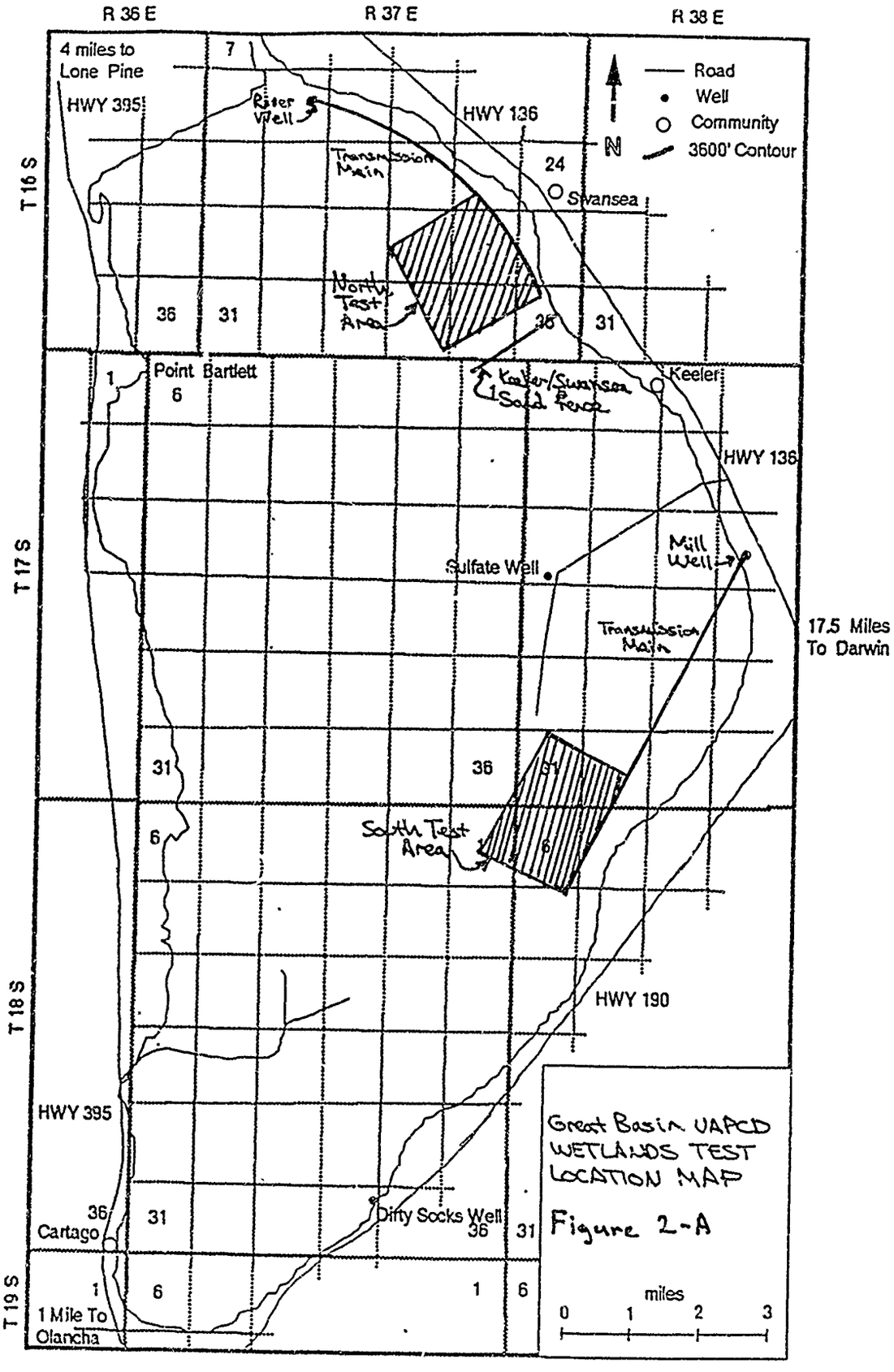
1) Continuous flows - unvegetated
2) Intermittent flows - unvegetated
3) Continuous flows - vegetated with nutrients
4) Continuous flows - vegetated without nutrients
5) Intermittent flows - vegetated

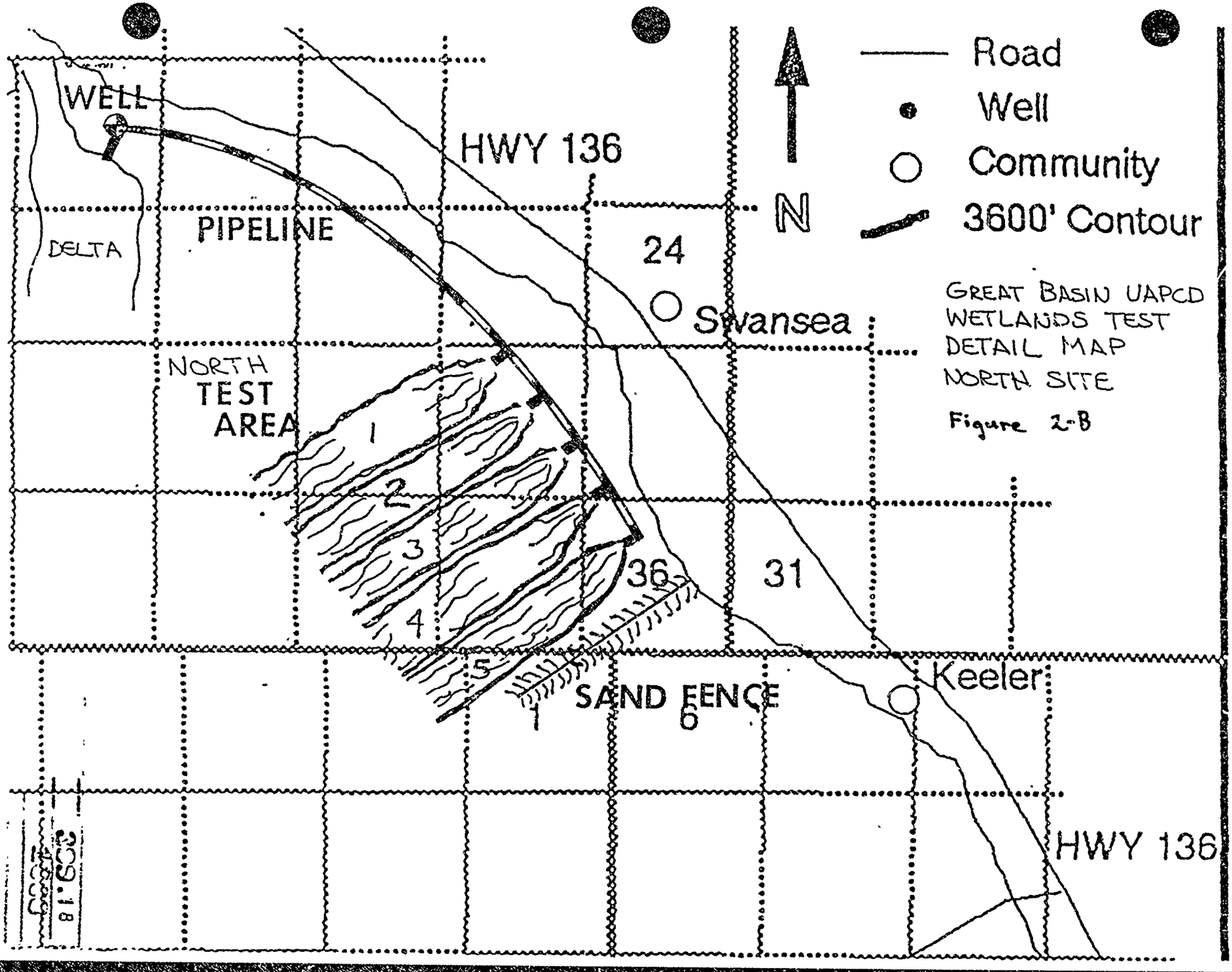
The southern test site will use water from the GBUAPCD Mill Site Well. A pump station will be constructed at this site, as only the well exists at the present time. Water will be taken to the test site with 28,000 feet of rented irrigation pipe laid on the surface of the Lake. Water will be distributed from the southerly 10,000 feet of pipe. The soils in this area are predominantly clay and the surface consists of mudflat type areas

Figure 1



Map adapted from E. Raisz Landform Map of the United States


R 36 E
R 37 E
R 38 E
4 miles to Lone Pine
HWY 395
7
River Well
HWY 136
Transmission Main
24
Swansea
Road
Well
Community
3600' Contour
N
T 16 S
North Test Area
36
31
36
31
Point Bartlett
1
6
Keeler/Swansea Solid Fence
Keeler
HWY 136
T 17 S
Sulfate Well
Mill Well
Transmission Main
17.5 Miles To Darwin
31
36
31
South Test Area
6
1
6
T 18 S
HWY 190
HWY 395
36
31
Cartago
Dirty Socks Well
36
31
T 19 S
1
6
1
6
1 Mile To Olancha
Great Basin UAPCD
WETLANDS TEST
LOCATION MAP
Figure 2-A
miles
0
1
2
3


WELL
HWY 136
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1
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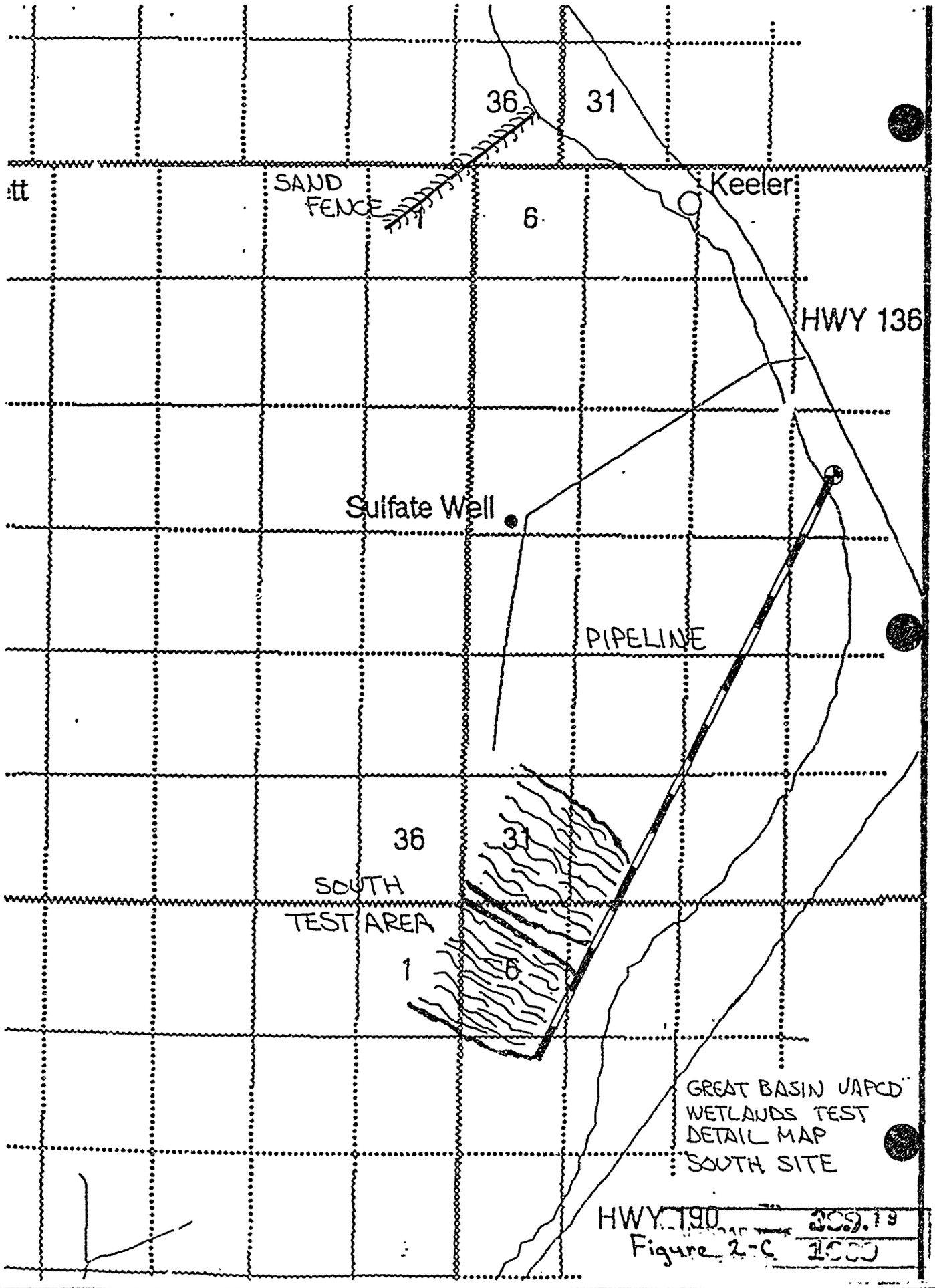
31
SAND FENCE
Keeler
HWY 136
GREAT BASIN UAPCD
WETLANDS TEST
DETAIL MAP
NORTH SITE
Figure 2-B


36
31
SAND FENCE
Keeler
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HWY 136
Sulfate Well
PIPELINE
36
31
SOUTH TEST AREA
1
6
GREAT BASIN UAPCD
WETLANDS TEST
DETAIL MAP
SOUTH SITE
HWY 190

Figure 2-C

subject to salt efflorescence. The test area will be divided into a continuous flow and an intermittent flow sections. The testing of vegetation is not planned for this site. Work will extend over three years as follows: 1) pilot design and installation of a larger pump at the River Site well will be done in FY 1992-93; 2) implementation in FY 1993-94; and 3) data acquisition and analysis will be done in FY 1994-95.

Water will be allowed to flow naturally over the test areas at both sites. The test will take advantage of the "micro-relief" of the Lake bed to create random, braided, naturally ponded and unponded areas. The ponds will be very shallow, on the order of one inch deep. Minor berms may be required to keep the test sections separate or to prevent loss of the water to the salt pan in the center of the Lake. The construction of such berms, if necessary, will be done by hand with a shovel or with a small tractor.

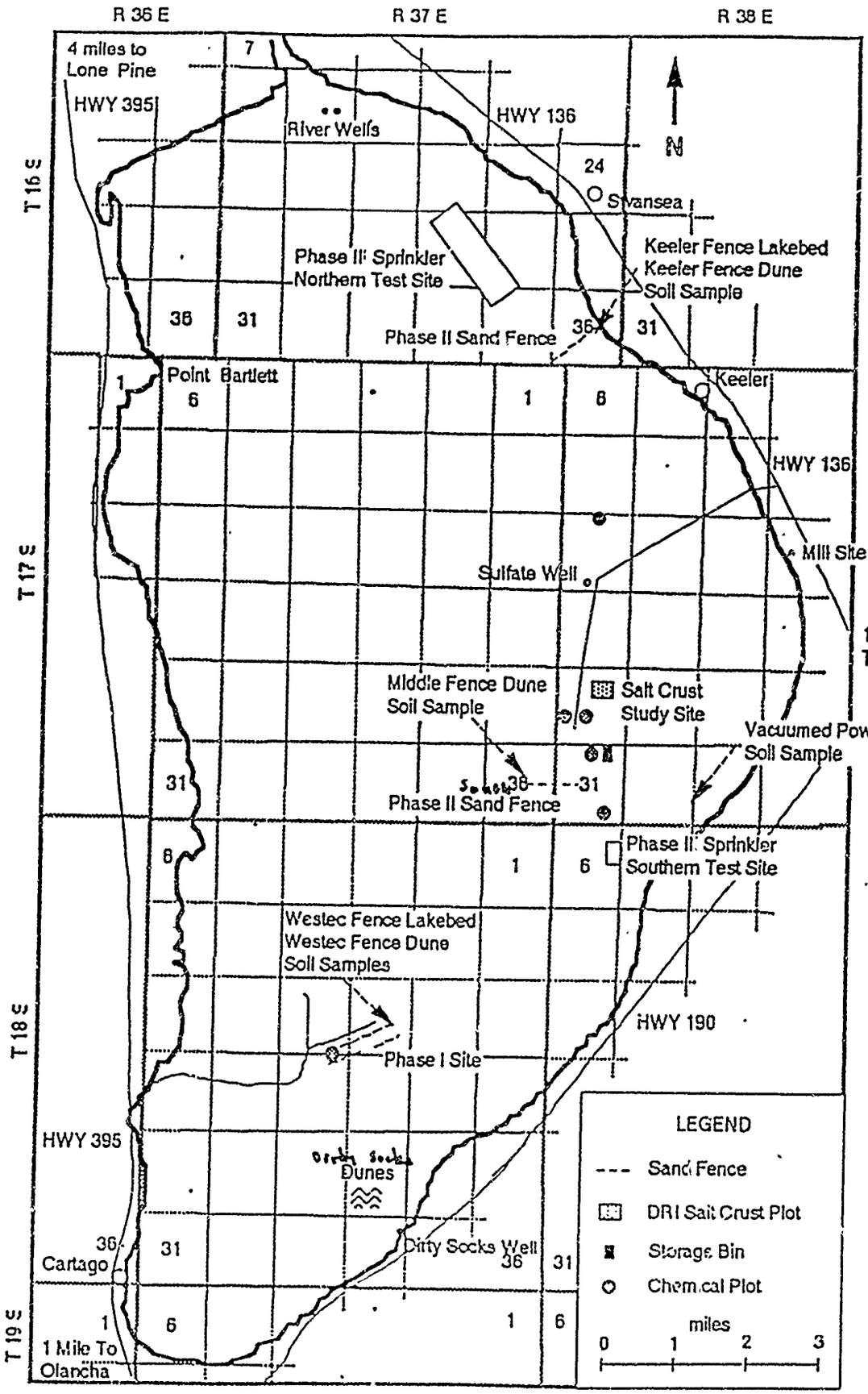
There will be an attempt to establish vegetation on three of the five test sections at the northern site. The results of initial baseline water and soil chemistry tests, along with preliminary soil nutrient, plant propagation, and other greenhouse tests will allow decisions to be made regarding the most appropriate species and planting techniques for the component. Only materials from native species will be used. Provision will be made to avoid the genetic contamination of local plant populations. Both the planted test species and any natural plant establishment in the unplanted areas will be monitored.

Both test sites have only sparsely used wildlife habitat. Wildlife surveys will be done before, during and after the pilot, to document the nature and extent of any wildlife benefits associated with the establishment of these wetlands. Survey methodology and personnel will be approved by the California Department of Fish and Game (CDFG).

Component 2-Sand Dune Array Bioremediation Test

Sand and sand-sized particles saltating (bouncing) across Owens Lake are known to generate large amounts of dust from the Lake bed during high wind events. A significant reduction in the air concentration of PM_{10} dust released can be achieved by controlling the migration of these particles.

Weaver and Giroux designed and installed three demonstration-scale fences in 1986-88 to determine if sand fences can create dunes that will capture saltating sand grains. The first fence, known as the Keeler fence, was a one-mile long structure designed to shelter the northern sand area from strong winds. The second fence, the South Fence, also one mile long, was designed as a capture structure, to protect the salt crust areas from abrasion. The last fence, the Dirty Sock Fences, was actually a series of


R 36 E
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T 19 S
4 miles to Lone Pine
HWY 395
River Wells
HWY 136
N
Swansea
Phase III Sprinkler Northern Test Site
Keeler Fence Lakebed
Keeler Fence Dune
Soil Sample
Phase II Sand Fence
Point Bartlett
Keeler
HWY 136
Mill Site Well
Sulfate Well
17.5 Miles To Darwin
Middle Fence Dune Soil Sample
Salt Crust Study Site
Vacuumed Powdery Salt Soil Sample
Phase II Sand Fence
Phase II Sprinkler Southern Test Site
Westec Fence Lakebed
Westec Fence Dune
Soil Samples
HWY 190
Phase I Site
HWY 395
Dunes
Cartago
Dirty Socks Well
1 Mile To Olancha
LEGEND
Sand Fence
DRI Salt Crust Plot
Storage Bin
Chemical Plot
miles
0 1 2 3

Figure 3

eight short fences, each rotated 45 degrees from each other, designed to stabilize existing dunes. The three test sites are shown on Figure 3. These fences provided data on sand capture, as well as data on differing construction and maintenance procedures.

This component will test the ability and effectiveness of various arrays of sand dunes, as opposed to the single dunes tested previously, to capture and control saltation and to reduce the erosion potential of wind at the surface. In four demonstration areas, arrays of sand fences will be built and monitored as the dunes fill and after the fences reach capacity. The fences will be constructed of UV-stabilized plastic mesh, with a 42 percent porosity, strung from metal fence posts. The fences will be about 4 to 6 feet high, and will extend for just under 400 feet in a curved pattern with support posts every 30 feet (see Figure 4).

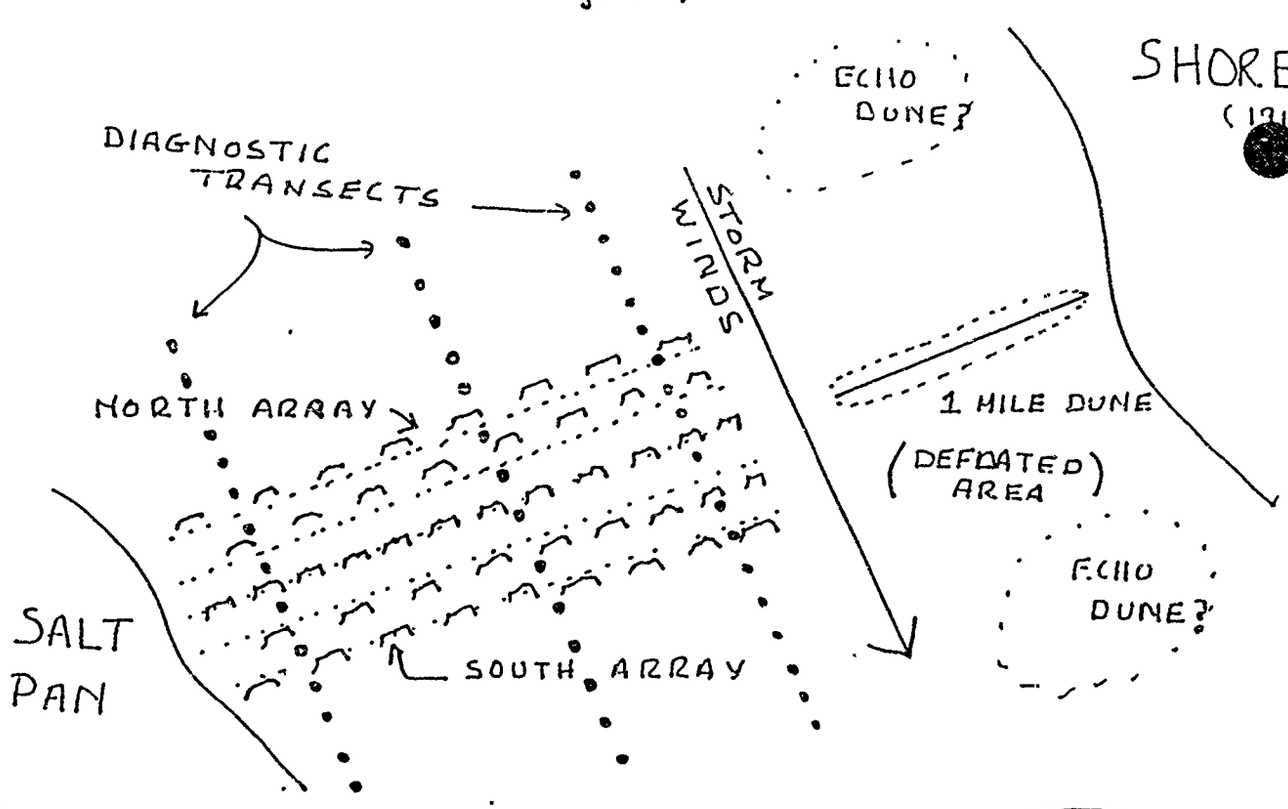
Based on experience gained from the earlier experiments, several construction procedures will be used to minimize damage to the salt crusts and Lake bed environment during the emplacement of the dune arrays. Access trails will be surveyed and clearly marked prior to the start of construction. Fence emplacement shall always begin at the edge of the salt pan and proceed up-slope. The fences will be built on the access road itself which will then be blocked by the fence and guy ropes. Only a single trip will be required for each fence emplacement, after which no visits will be made by equipment to the fences except in the case of fence failure. The Lake bed will be reached from existing access points. Construction staff will also be briefed by U.C. Davis biologists trained in Plover nest site recognition and avoidance.

The first array is proposed near the northeast margin of the Lake, near the town site of Swansea. The storm that generated the highest dust loading event in Keeler in 1991 originated at this location. The array would cover about half the sand corridor at this point on the Lake bed with 30 dunes arranged in a double staggered array 1/2 miles wide. Two fences would be built each day over four work weeks beginning in mid-July, 1992.

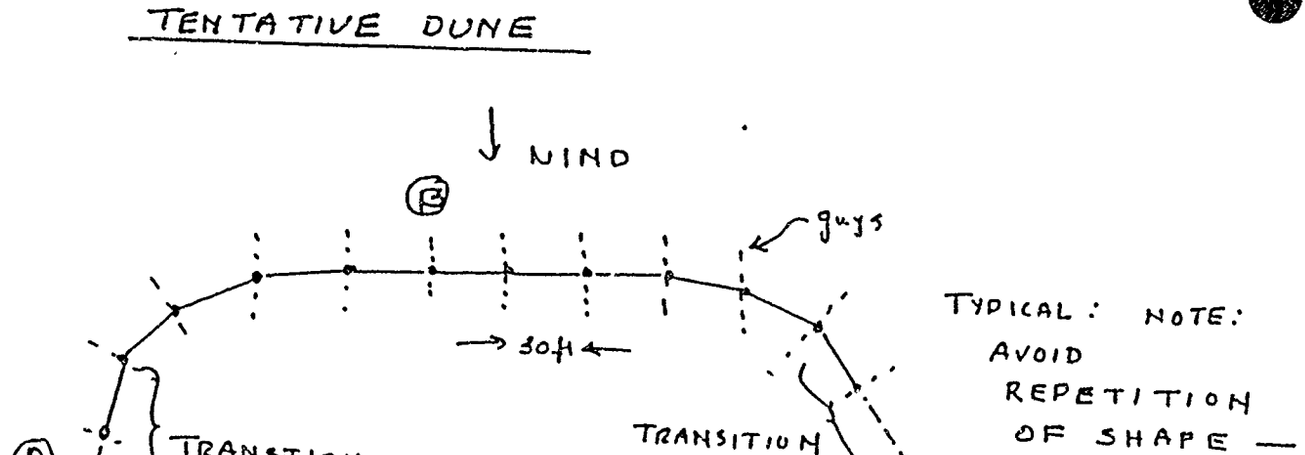
The second array would extend and widen the existing one mile Keeler fence. Sixty (60) or more fences would be built in five rows to capture both northern and southern storm winds. The array would extend from the existing fence to the salt pan in the middle of the Lake bed. Construction is planned to begin upon completion of the first array and will extend from about mid-August through mid-October, 1992.

The third array is planned to protect and further enhance the Sulfate Well riparian corridor. This band of water and vegetation has formed downslope from the Sulfate Well , but can be overrun by sand blowing in from the Lake bed (see map, Figure 5). A small array of dunes would be established to the west of the corridor to form a barrier for the corridor. Construction would begin in early

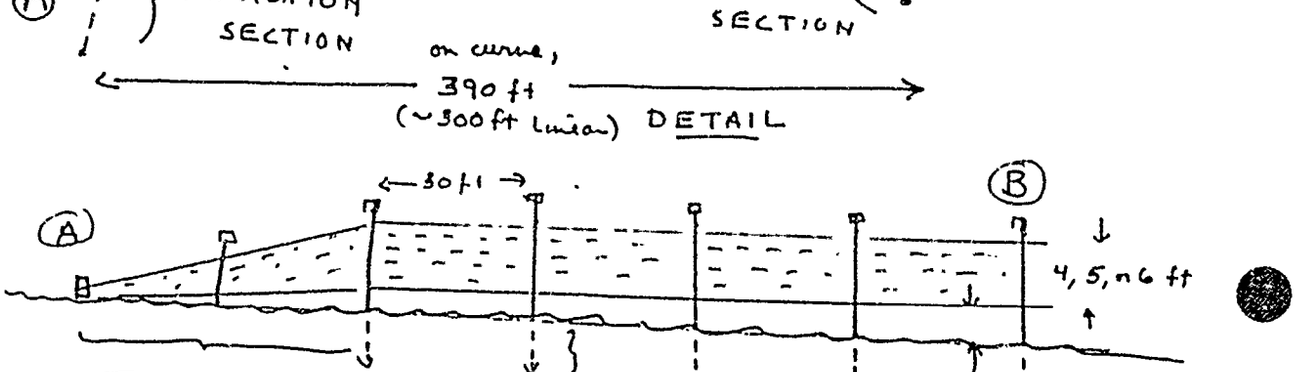
Figure 4



TENTATIVE DUNE



DETAIL



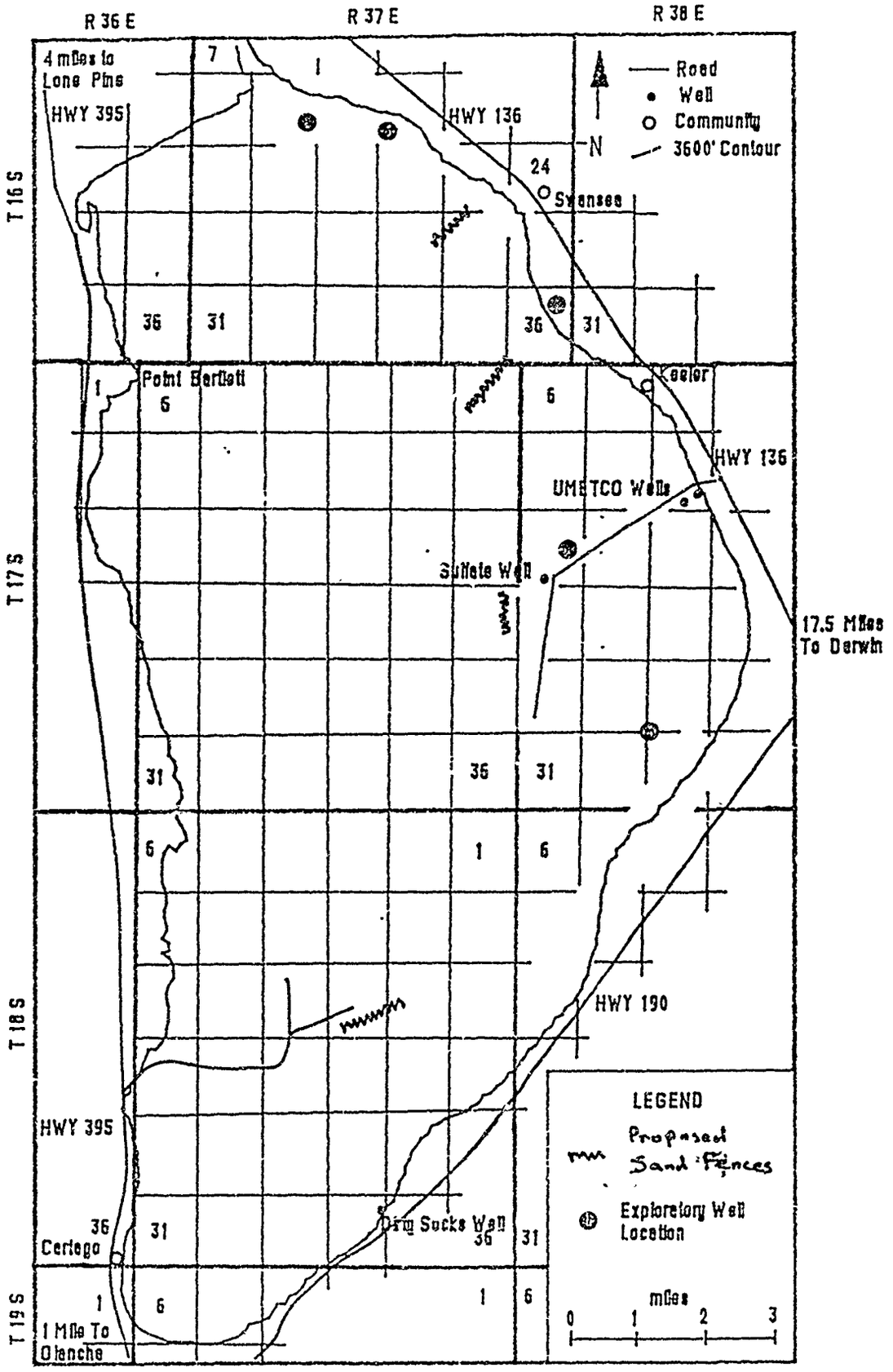


Figure 5

July, 1992, and be complete by the end of August, 1992.

The last array is planned for the south end of the Lake bed at a site studied by WESTEC. About sixty (60) fences would be installed from mid-July through the first of September, 1992.

Component 3-Shallow Groundwater Investigation

The near surface groundwater system of Owens Lake is largely unstudied. It is essential to understand this potential water resource prior to any consideration of large scale bioremediation efforts on the Lake surface. This component will be looking at interactions between the shallow groundwater and surface salt distribution, the production of efflorescent salt "fluff", interactions between the shallow and deep aquifer systems, the chemistry of the shallow water resource and the physical distribution of shallow groundwater.

The proposed design of the component involves transects that would run from the Lake margin out toward the center of the Lake bed (See Figure 6). Each transect will consist of piezometer sites spaced at half-mile intervals with a piezometer set into a shallow hole of up to 6 inches in diameter. The exact placement, length and number of transects and piezometer sites will be determined from information gathered from soil sampling programs, aerial photographs, surface observations and studies using a groundwater flow meter. The purpose of the component is to determine water levels and hydraulic gradients as well as their change over time. The chemistry of the shallow groundwater and surface crust will be measured as well. The component design is the responsibility of the Desert Research Institute working in conjunction with the GBUAPCD. Crews of less than five people would be installing the transects, one at a time.

Component 4-Deep Aquifer Investigation

Many of the proposed long-range bioremediations have, as a common component, the use of water. Before the feasibility of such proposals can be determined, more information on the amount and quality of the deep aquifers is required. Information on both water quality and quantity is required. Some information has been gathered by the GBUAPCD's testing of the River wells, the Swansea-Keeler well and the Mill Site well, but not enough information is available to characterize the aquifer system as a whole at Owens Lake. Evaluation of the water producing capabilities from the deep aquifers is impossible until more data is obtained on the areal extent, depth, thickness and hydrology of aquifers identified as having the potential for water development.

This project is broken into two separate subprojects: a high resolution shallow seismic reflection survey and a Transient Electromagnetic (TEM) survey.

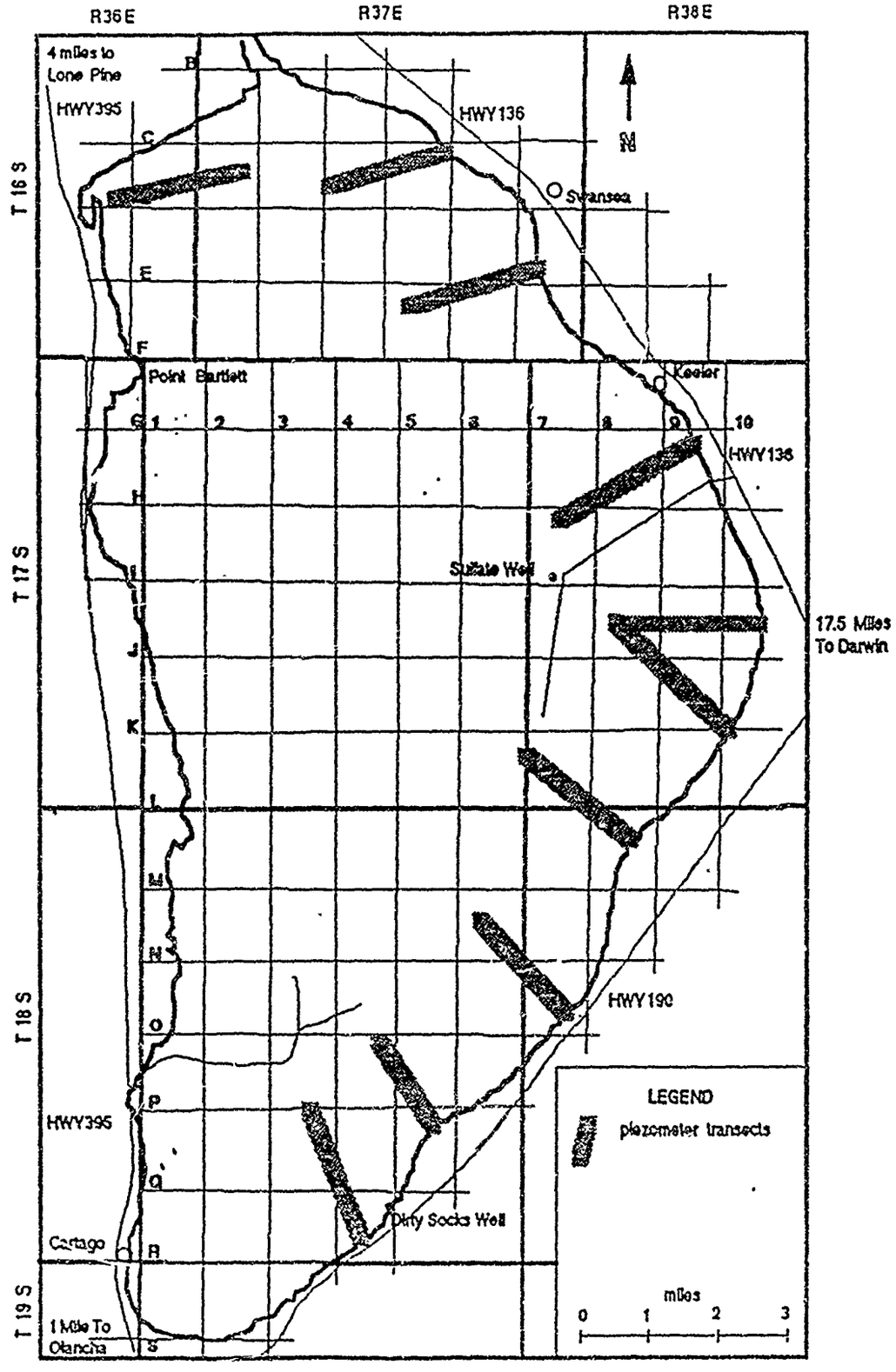


Figure 6 Location of piezometer transects

The seismic investigation will be conducted on the lake bed and will require vehicular travel over much of the northeastern and southeastern portions of the lake bed. Travel will probably be conducted by 4WD pickup trucks and ATV's. The field work for the project will be composed of setting up lines of small geophones in an array away from a central charge. The charge will probably consist of a small explosion of dynamite buried a few feet under the lake bed surface. The detonation of the dynamite should not generate any significant above ground noise or crater in the ground surface.

The TEM survey will be conducted along the shore line and alluvial fans adjacent to the southeastern side of the lake and along the northwestern shoreline of the lake. Vehicular travel during the survey will be conducted by 4WD pickup trucks and ATV's off the lake bed. The survey areas do not include the habitat area for the dune weevil. The field work for this survey will consist of setting up transmitter loops to induce a transient electromagnetic field into the earth. The electromagnetic field generated during data collection should not harm any plant or animal life in the survey area.

Component 5-Surface Water Investigation

The numerous seeps and springs along the shore of Owens Lake provide a perennial, though variable, source of surface water. Any bioremediation plan must make provisions both for the presence of this water and for the protection of the ecological value of the environments it creates. There are also ephemeral water sources such as storm runoff from the surrounding mountains and diversions from the Los Angeles aqueduct down the Owens River. Flash floods entering the Lake bed appear to be one of the primary mechanisms for distributing salts and sediments onto the Lake bed. The halo of salts near the Lake bed margins created from evaporation of waters from the marginal seeps and springs is easily dissolved and transported out onto the bed of the Lake by these flash flood events.

Long term studies focusing on the areal extent, chemistry and sources of water entering Owens Lake have been designed in conjunction with the Desert Research Institute. Information from this component will be used to conduct a preliminary storm water hydrology study to identify potential quantities and routes of storm water flows. A combination of aerial photography and field investigations will be used for this component. The field investigations would consist primarily of taking water samples from the various streams and gullies entering the Lake bed. These samples will chemically analyzed and correlated with field notes describing the site where the sample was taken.

Component 6-Vegetation Research

Vegetation has been an accepted means for stabilizing soils to prevent wind erosion in many locations, and this methodology may play a role in the bioremediation of Owens Lake dust releases. The potential for vegetation in this application is unknown because the effects of the limiting factors presented by the harsh Lake bed environment on plants are largely unquantified. Known limiting factors for plant growth include the presence of salts, toxic ions, flooding, evaporative stress and sand blast damage to leaves and bark. Previous studies, which involved attempts to grow plants on the Lake bed, did not quantify these limitations.

This component is divided into two studies. The first study includes a field reconnaissance of the existing conditions on and off the dry Lake bed and studies of the mineral concentrations in the tissue of naturally occurring candidate species of plants growing on or near the Lake bed environment. There will be minimal collection of plant material. If there is available water near the plants sampled, then Ph, salinity and ionic contents of the water will be determined. The second study will determine the tolerance of candidate species to salinity, toxic ions, flooding and simulated sand blast treatments under greenhouse conditions. These studies will be done by staff of the University of California, Davis, under the leadership of Dr.s Dahlgren and Richards, working under the review of GBUAPCD staff.

Component 7-Aeolian Transport Study

While it is known that large amounts of material are transported across and off Owens Lake during high wind events, the actual amount of movement has never been adequately studied. Soil erosion and deposition play important roles in the identification of areas suitable for the testing and deployment of any proposed dust bioremediation measures. An understanding of the source areas for sand, dust and salt, as well as the natural depositional and erosional processes is needed to properly design and orient bioremediation measures that capture sand, such as sand fences.

This component will determine the extent and amount of materials transported, eroded, and deposited by aeolian process during high winds at Owens Lake. It will be split into two parts. The first part will focus on quantifying the areal extent and amounts of deposition and erosion, as well as the flux of particle migration on and adjacent to the Lake bed. This part of the component will consist of transects oriented perpendicular to the prevailing wind directions which will be instrumented with sand transport catchers, dust deposition pans and small sections of sand fences for sand impoundment measurements. The second part will focus on addressing the impact of dust plumes originating from the Owens Dry Lake bed on areas south of the Lake into the Indian Wells Valley. Standard EPA methods for measuring PM_{10} will be used to determine the potential human health impacts in relation to the air quality standards.

Component 8-Physical Characterization of the Lake Bed

This component is a continuing effort to map and characterize the soils and surface conditions on the Lake bed. The Owens Lake Data Base and Physical Characteristics Mapping Project of 1991-1992 is adding significantly to the knowledge of soils on the Lake bed and created a detailed topographic base map of the Lake bed and surrounding area. This knowledge is still incomplete. A general knowledge of the location of dust sources, Lake bed features, geomorphology, soil type distribution, extent of wetlands and Lake bed gradients is now available. Much of this data has, however, been gathered on a coarse scale, and has not been accurately mapped.

This component will map, at a detailed level, dust source areas, man-made and natural geomorphology, wetland features and Lake bed gradients. The data points will be more closely spaced than in previous work. Mapping will be done using a Global Positioning System (GPS) so that data can be directly entered into the GBUAPCD and SLC geographic information systems. Additionally, this component will utilize 50 historic satellite images from the 1970's and 1980's to investigate the spatial variation of certain features on the Lake bed over time and images in 1992.

Component 9-Pre-Bioremediation Engineering Studies

The identification of engineering restraints is important to the selection of final bioremediation measures. If a selected bioremediation cannot be constructed due to conditions at a specific site that can't be overcome with engineering design, that bioremediation cannot be used at that site.

This component will address Lake bed access, drainage and leaching designs and irrigation methods. Lake bed access has presented problems in all tests done to date on the Lake bed and will likely be a major issue in future tests and final bioremediation implementation. It is critical to have good access under varying conditions to all areas of the Lake being tested or being used as a bioremediation site. Similarly, if a water based bioremediation is incorporated in the final bioremediation plan, it is important to identify the best method and frequency of water application to produce the result required with the least possible amount of water applied. In certain areas of the Lake bed, leaching and drainage of Lake bed soils may be desired to prevent salt build up in the root zones of vegetated areas. Engineers from the University of California, Davis, will work on this component with staff of GBUAPCD. Most of this work will be done in the office, with some leaching tests being performed on the Lake bed. These tests would be done on areas already having access, and would cover less than 100 square meters.

Potential Impacts and Mitigations Incorporated Into the Program

For components 1,2,3 and 7 travel will include construction crews, maintenance over the life of the pilot, and investigators evaluating the results from each site. For components 4,5,6 and 8 only the investigative aspects involve traffic in the project area. The traffic will consist of small numbers of four-wheel drive vehicles and small groups of people on foot. Construction, maintenance and research personnel will be instructed to avoid any direct disturbance to wildlife, including the Tule elk and water birds, encountered while in the field.

Damage to the Lake margin habitats will be minimized by using only existing roads and trails which lead to the Lake bed. Access for each project component will be surveyed in advance by a qualified biologist for sensitive plant and animal species and routes will be selected which avoid disturbance of sensitive plants, animals and habitats. The survey process will consist of walking the area of the proposed access routes and determining the presence of sensitive species and estimating their probable or actual use of that area.

The pipeline for the south test area in Component 1 may cross some vegetated areas. However, no significant impacts to vegetation is expected. The pipeline will be placed on the ground surface and access will be kept to the minimum necessary. A biologist will survey the south pipeline route for Component 1 in advance to avoid the possibility of impacts to vegetation, including sensitive plant species,. A route which is the least damaging to vegetation and which avoids any sensitive plant species will be selected for the pipeline. Construction and maintenance crews will be instructed to use designated access routes and minimize any vegetation disturbance.

All moist alkaline grassland areas which could be affected by any construction, access roads, piezometer placement, or other maintenance or investigative procedure will be surveyed in advance by a biologist to avoid potential impacts to alkaline meadow sensitive plants or the Owens Valley California Vole. The alkaline meadow areas of the Owens Lake bed have been significantly trampled by cattle. This habitat destruction minimizes the likelihood that Owens Valley Voles are present. As noted above, the entire pipeline route for the southern test site will be surveyed. Impacts to any moist grassland vegetation will be minimized and impacts to any sensitive species will be avoided by the selection of the least sensitive right of way for the pipeline. Prior to placing the pipeline or locating any test equipment in grassy areas, a biologist will examine the area for signs of vole burrow or runway activity. If any areas of meaningful or viable vole population size are discovered, they will be avoided, thus eliminating the potential for any significant adverse impact.

A potential impact from the proposed projects is the possible disturbance of nesting Western Snowy Plovers, a California Species of Special Concern. The male Plovers begin arriving in March, and start to establish breeding territories. If forced to move, they may abandon breeding for that season. The young have become independent enough to leave the nesting site by mid-to late September. Because this period is also when the Lake bed surface is most stable, it is not possible to avoid construction for the whole 7 month breeding season. Observations by staff trained in recognition of the Plover nesting sites have found them on all parts of the Lake at one time or another, so it is also impossible to completely avoid habitat areas.

Any particular line of access to a project would have only limited potential to intersect a nest site since Snowy Plover nests are typically widely and sparsely distributed over a large area. During previous work done by the GBUAPCD, trained survey staff marked out routes free of Plover nesting sites for the major routes to and from the project sites. This mitigation, to be carried out by a trained biologist, is incorporated into this pilot program as well. This circumstance will greatly reduce the impact of the program on the Plovers. Staff of the GBUAPCD have been trained in Western Snowy Plover identification and identification of nesting sites by recognized Snowy Plover expert Gary Page of the Point Reyes Bird Observatory.

Construction, maintenance, and research crews working along the individual pilot transects, dune fences and pipelines will be briefed on the Plover's presence and habits. Disturbance of Plover behavior and habitat, in particular, nesting sites, will be avoided as much as possible. All active nests discovered in the course of this project will be reported to the CDFG. Destruction of any active nests will be avoided, pusuant to § 3505 of the Fish and Game Code.

Over the course of the three years that components of the program will be in operation, it is anticipated that some minor impacts may affect the resident Plovers, primarily due to the disturbance of a few nesting individuals. This impact is not considered significant, due to the small numbers effected and the large area of the Lake which can remain unaffected.

Environmental Setting

The proposed program area is the dry Lake bed of Owens Lake. Owens Lake is an alkaline dry Lake, or playa, in the southern end of Inyo County on the eastern side of the Sierra Nevada mountain range. The elevation of the Lake bed is approximately 3,551 feet above sea level. The Lake bed extends about 17 miles north and south and 10 miles east and west and covers an area of approximately 108,000 acres. The current Lake bed surface consists

of eight different playa environments: salt pan, salt crust, mudflat, sand flat, dunes, delta deposits, beach deposits and spring mounds.

Saint-Amand (1986), and references cited therein, provide evidence that a lake or a series of lakes existed in the proto-Owens Valley from at least the early Pleistocene, about 1.8 million years ago. During much of this time frame, the water in the lake flowed out of the basin through Rose Valley and into China Lake. Although it is thought by many that Owens Lake probably dried up several times during the Pleistocene, two deep cores on the lake bed (U.S.G.S. and Pittsburgh Plate Glass Co.) have failed to identify any previous episodes of desiccation. The high stand of the lake that produced the shorelines at an elevation of 3,880 ft. is estimated to have occurred 15,000-16,000 years ago. It is believed that from this date to the present that Owens Lake has been a continuously closed basin.

There was considerable agriculture in the Owens Valley, but the Lake was originally a focus for mining interests. Silver mines on the east shore led to steam navigation on the Lake, and attempts to recover valuable salts from the Lake itself began in 1884. Sodium carbonate (Trona) mining began to provide a major raw material for glass manufacturing.

In 1917, the City of Los Angeles completed a fresh water aqueduct system that diverted the water of the Owens River south to the City. With its primary water supply gone, Owens Lake was virtually dry by 1925.

Air Quality

Normally, air quality in the Owens Valley is excellent. However, the region does experience periods of strong winds that result in blowing sand and dust. Such episodes contribute to visibility degradation and an overall reduction in air quality from suspended particulate matter over a wide region.

The 1988 Owens Valley PM_{10} Planning Area State Implementation Plan and its associated Long Range Dust Bioremediation Plan describe the impetus behind the development of dust bioremediation efforts on the Owens Lake bed. The SIP identifies that the violations of the Federal and State PM_{10} standards in the southern Owens Valley are primarily the result of dust storms arising from the dry bed of Owens Lake. These dust storms produce significant reductions in the air quality downwind of the Lake and create conditions which exceed the significant harm to health levels set by the EPA.

Geology

Owens Valley is a fault-bounded basin, between the upraised

blocks of the Sierra Nevada and Inyo Mountains. The Lake bed itself is made up of Holocene alluvium and lacustrine deposits. The project area is within a seismically active region. Significant earthquakes have been recorded from 1872 to the present. Historic earthquakes have had epicenters on the Owens Lake Fault, the Sierra Nevada Fault, and several unnamed faults on the east side of the Lake bed. Estimates of magnitude range from 4.0 to 6.5 on the Richter scale. The Lake deposits may liquify under strong seismic shaking.

Soils

Soils on the Owens Lake bed are moist within one to six inches of the surface throughout the year. Salt crusts develop on the Lake bed surface in varying thicknesses and textures from season to season. When wind speeds exceed the soil erosion threshold, dust emissions rise from the dried and damaged surface soils.

As shown in Figure 7, eight different playa surfaces have been identified in earlier investigations by the Desert Research Institute. These are, in order of descending size, salt pan, salt crust, mudflat, sand flat, dunes, delta deposits, beach ridges and spring mounds. The salt pan in the center of the Lake bed is the largest single area. Salt crusts are interspersed along the perimeter of the salt pan with the largest crust areas existing at the eastern side between Keeler and Olancha. Mudflats and sand flats make up the remainder of the eastern and southern portions of the Lake bed while a large delta deposit is interspersed with smaller salt crust areas along the northern end of the bed. Beach ridges exist between salt crusts along the western shore.

The salt crust undergoes an annual cycle in terms of both hardness and adhesion. Typically during the summer months, the surface rind is hard, while the near-surface sublayer remains soft above a very hard compacted layer. At these times, the hardness of the base layer allows four-wheel drive vehicles to traverse the Lake bed on a line from Keeler to Olancha with little difficulty except in a few softer areas where surface drainage from shoreline springs weakens the sublayer. Where the rind is direct contact with the sublayer, it forms flat plates of hydroscopic crystals.

A noticeable change in the salt crust occurs in early winter as a result of a combination of cooler temperatures and precipitation. The first rain of the winter season creates a rapid series of changes in crust morphology. Water leaches salts from the surface layers, which form a rind with a mulch-like texture. The clays left behind are saturated with water and become slippery, but remain very cohesive. During this period, traversing the surface by truck becomes almost impossible due to a lack of traction and frictional drag.

During the Spring, the surface dries rapidly and becomes a

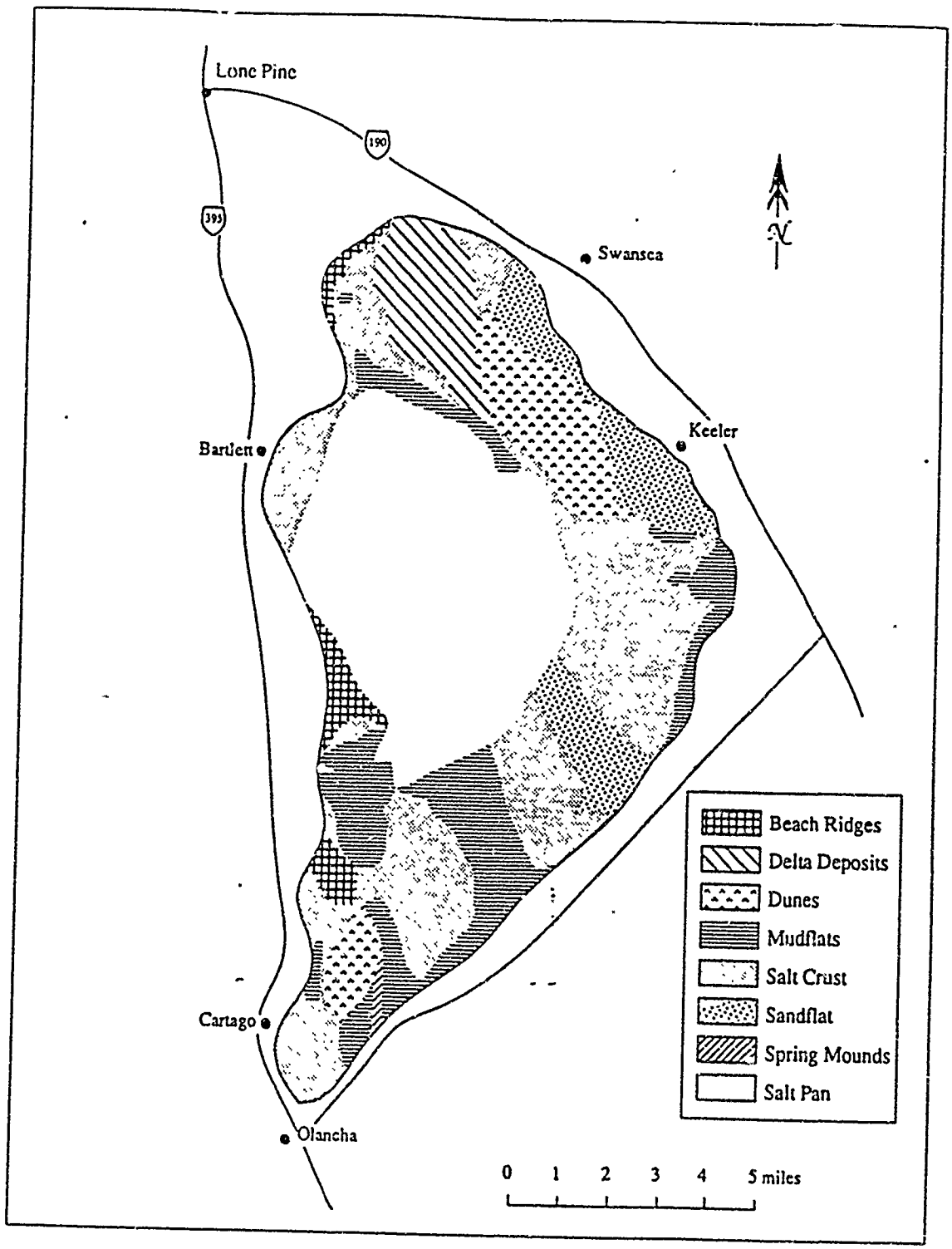


FIGURE 7 Sketch of the lakebed surface showing eight different playa environments identified in the Phase I investigation.

wick for the salts that were dissolved by the rains. Capillary action brings the salt back to the surface. At this point, the semi-soft rind undergoes a buckling action as it forms numerous irregular knobs that are soon covered with a white bicarbonate salt powder resembling thousands of soft small heads of cauliflower. The thin rind separates from the sublayer except along irregular support points. There are lumps in the rind layer due to differences in salt hydration and dehydration between the rind and the loose sublayer. With the onset of warmer temperatures and the end of the rainy season, the sublayer surface under the rind dries and a fine powdery aggregate layer forms at the surface; its appearance is often mistaken for snow by passing summer season traffic along the highway.

The on-Lake sand fields represent a second source for airborne dust. Sand fields are defined, for this study, as areas with a depth of sand greater than one-quarter inch. The largest sand fields exist along the Lake bed perimeter northwest of Keeler. Many smaller fields are scattered along the eastern side of the Lake bed, and some large, mobile dunes have formed in the east-central part of the bed. These fields both provide a source of emissions and a source of sand that can damage the salt crusts and increase the emissions from those areas as well.

__Climate__

Weather in California is a continuous series of interactions between maritime air masses and those of continental origin. The Owens Valley and Lake are well protected from the maritime influences by the masses of the Sierra Nevada, and so experience a much more continental climate pattern. This climate is characterized by warmer summers, colder winters, greater daily and seasonal variation in temperatures and generally lower relative humidities than maritime climates.

According to the National Weather Service and data gathered by the GBUAPCD, summer temperatures in the valley often exceed 100° F, followed by evenings in the mid-60's to low 70's. Afternoon temperatures in mid-winter are moderate and, on the average, only fail to rise above freezing about 10 days per year. More than half of the area's precipitation, falling largely as a mix of rain and snow, occurs from December to March. Precipitation totals range from 5 to 10 inches per year. Summer rain comes mainly as brief thundershowers in the middle to late afternoon. Humidity is low during the summer months and moderately low during the winter months.

The intensity and duration of surface winds over the Owens Lake area, within 300 feet of ground level, are governed by the topography which influences the large-scale synoptic patterns over the Basin and Range provence. This results in the vast majority of surface winds flowing up-valley (predominantly from the south or

southeast) or down-valley (north or northwest). Four main wind flow patterns have been observed in the Owens Lake area, two resulting in up-valley flow and two resulting in down-valley flows. Up-valley flows usually stem from storm fronts passing south of the Owens Valley or local heating differentials between the valley floor and the surrounding mountains. Down-valley flows come from channeling of prevailing maritime westerlies or local drainage flows resulting from radiative cooling of the mountains. An important threshold velocity for surface winds is 10 mph. Sand begins to move on the Lake surface at and above this velocity.

Winter weather can occur from November through February. During this season, down-valley surface winds are prevalent. During this time of year, up-valley winds greater than 10 mph occur less than 10 percent of the time, usually as a result of storm front passage. Spring weather (March through June) results in an equal occurrence of up-valley and down-valley patterns. Both patterns have winds greater than 10 mph over 20 percent of the time. The summer pattern (July and August) has up-valley winds predominating, with down-valley winds of greater than 10 mph appearing less than 5 percent of the time. The Fall pattern is weak and is comprised of either a continuation of the summer pattern or an early beginning of winter.

The typical daily pattern of wind movement is a down-valley movement at night and in the morning, and up-valley flow in the evening. The drainage effect, one of the conditions of down-valley winds, is stronger in the winter, while the upslope effect, which produces up-valley flows, is stronger in the summer, particularly in the afternoon. Beginning in June, the up-valley flow begins to be established earlier in the morning which accounts for higher proportions of up-valley winds at this time of year. The strongest winds, those associated with storm fronts, usually have a westerly component, and their intensity and duration depends on the track of the storm. While strong west winds do occur occasionally in the area, the more frequent direction of strong winds is northwesterly. The peak gust experienced annually in the area is usually between 65 mph and 75 mph.

Water

Owens Lake lies within a hydrologically closed basin. It is located between the Sierra Nevada range on the west and the Inyo and Coso Mountains on the east. Elevations range from 3,551 feet on the Lake bed to 14,495 feet at Mount Whitney. The Lake bed has been dry since the mid-1920's. The basin is bounded by the basement rock complex-valley fill contact on the east and west and the divides for surface flow on the north and south.

Water inflow to the Owens Lake basin comes from four sources: 1) precipitation; 2) the Owens River; 3) intermittent mountain runoff; and 4) subsurface flow from outside the basin.

Owens Lake is within the "rain shadow" of the Sierra Nevada range immediately to the west. Precipitation along the eastern slopes of this range decreases sharply along with elevation. The annual rainfall along the Sierra crest is over 22 inches per year, while Keeler, on the east side of the Owens Lake, receives less than 4 inches on average. Precipitation still provides, nonetheless, the largest component of water inflow into the basin. An average of 75,000 acre-feet falls on Owens Lake and the surrounding valley fill deposits.

The Owens River carries an estimated base flow of approximately 3,000 acre-feet of water annually to Owens Lake. During high runoff years, water is released from the Aqueduct System into the lower Owens River for operational purposes. The mean annual inflow to the Lake at the Keeler Bridge for the period 1940 to 1980 is 10,700 acre-feet.

Runoff from the surrounding mountains is the second largest component of inflow to the area. Significant recharge of the groundwater basin occurs when the creeks pass over the highly permeable alluvial material surrounding the Lake. Approximately 45 percent of the base of mountain flow infiltrates the groundwater basin by the time the flow reaches the aqueduct. Occasional flash floods reach the Lake through numerous intermittent stream channels. An estimated 40,000 acre-feet recharges the Owens Lake Basin groundwater system annually.

Subsurface inflow to the groundwater system occurs from Centennial Flat, the intermediate mountain recharge area and the upper Owens Valley. An estimate of the average subsurface inflow to the basin is 18,800 acre-feet per year.

Owens Lake is located at the lowest point within the basin and groundwater entering the area as subsurface flow and percolating runoff generally flow towards the Lake. Several well defined aquifers exist below Owens Lake. The aquifers consist of coarse sand and gravel separated by layers of clay. Water naturally escapes the groundwater basin as spring flow or evaporation of confined water leaking upward.

Several springs exist along the margins of the Lake bed, some flowing intermittently and others permanently. These have been poorly mapped and their flows are not documented. Those with stronger or more lasting flows have generated wetland areas along the old Lake shore. These areas support some salt-resistent plants and related wildlife.

A large confined aquifer system about 250-300 feet deep exists on the eastern side of Owens Lake. Several artesian wells near the eastern shore of the Lake tap into this aquifer and flow at approximately 300-600 gpm. These wells are sometimes called "springs" and provide the source of the ponds in the interior of

the Lake bed. Some plants have established themselves near the water and algal mats have formed in most of the ponds. This aquifer is most likely recharged by runoff from the Inyo Mountains. The western extent of this aquifer is unknown, but it appears to extend southerly beneath the eastern portion of Owens Lake.

Biology

The descriptions of the biological setting in this section are derived from limited site visits by SLC staff, review of aerial photos and maps on file at the SLC, and various environmental documents and reports done for previous projects at Owens Lake. These studies, listed below, were based on results of both field work and literature reviews.

Great Basin Unified Air Pollution Control District. 1988. State Implementation Plan for Owens Valley PN-10 Planning Area and Negative Declaration, SCH. No. 88110703.

California State Lands Commission. 1977. Lake Minerals Corporation Proposed Salt Harvesting Operations at Owens Lake Negative Declaration, SCH. No. 77040473.

Los Angeles Department of Water and Power. 1990. Unpublished vegetation survey done for GBUAPCD dust mitigation studies, Southern Test Site.

Other information sources are cited in the text.

The Owens Lake area is considered essentially an ecotone between the northern Mojave Desert and the Great Basin Desert. This implies that one might find plant or animal species from either or both regions within the project area. However, the Owens Lake area has the dry, hot summers characteristic of the Mojave, but the elevations provide the colder winters of the Great Basin, and this tends to limit species one might otherwise expect to find. The high salinities and absence of vegetation limits many other species.

Vegetation

The vegetation in the project vicinity was characterized by the GBUAPCD in a Negative Declaration prepared in 1988. In this document, Groeneveld describes three plant communities (assemblages) on the margins of, and onto, the Lake surface. The vegetation classification is based primarily on hydrology and geochemistry. In increasing order of drought and salt tolerance, the communities identified are: 1) emergent aquatic vegetation; 2) phreatophytic vegetation (plants which tap ground water); and 3) desert fan/Lake margin vegetation.

Emergent aquatic vegetation, while uncommon at Owens Lake, is dominated by plants which grow in relatively fresh water. In the project area, this vegetation occurs only around the springs located on the Lake margins. Species typical for this community include bulrushes (Scirpus sp.) and cattail (Typha sp.). Less frequently, floating plants such as duckweed (Lemna sp.) or water fern (Azolla sp.) can also be found. The springs and wells further on to the Lake bed do not support this group of plants because the dissolved salt level is too high. Mapping coverage for this group is good and the probability of discovering previously unknown locations around the Lake bed is low.

Phreatophytic vegetation is dominated by plants which require shallow groundwater, but have a higher tolerance for drought and soil salts than do the freshwater plants described above. This community is often dominated by alkaline meadow grasses such as alkali sacaton (Sporobolus airoides), saltgrass (Distichlis spicata var. stricta), and rabbitfoot grass (Polypogon monspelliensis). Other plants found in association with these grasses include wire rush (Juncus balticus), the herb yerba mansa (Anemopsis californicum) and the wild sunflower (Helianthus annuus var. jaegeri). Around the margins of the interior springs the dominant shrubs are rabbitbush (Chrysothamnus nauseosus var. viridulus) and greasewood (Sarcobatus vermiculatus).

The last community, desert fan/Lake margin vegetation, includes those plants which do not require groundwater, existing on precipitation water alone. They also have a fairly high tolerance to the dissolved salts which have become enriched in the local soils. The dominant perennials in this group are the shrubs cheesebush (Hymenochlea salsola), shadscale (Atriplex confertifolia), spiny sagebrush (Artemisia spinescens), desert tomato (Lycium sp.) and spiny horsebush (Tetradymia axilaris). Parry's saltbush (Atriplex parryi) and desert holly (Atriplex hymenelystra) is common on the southeastern margins of the Lake.

These three communities exist almost exclusively on the margins of the old Lake, with very little colonization of the Lake bed interior. The third community, desert fan, occupies the majority of the margins, occupying the fans encroaching on the Lake from the surrounding mountains which are very well drained and above the areas of shallow groundwater. The first two communities exist where soil wetness, fine soil texture and low soil oxygen preclude upland plants of the third community and foster the growth of wetland species. The amount and salinity of the water available determine which of the first two communities predominate at a given site. The boundary lines between communities can fluctuate over time as the groundwater level goes up or down, or, on a shorter scale, during exceptionally wet or dry years.

Vegetation is almost absent on the surface of the Lake bed itself. Occasional colonists venture onto the surface in wetter

years, but are almost universally killed by lack of water or sand blasting. Earlier experiments have shown that plants can establish themselves on the playa soils, but need varying degrees of supplemental water and/or sand protection for long -term survival.

Project Component 1 involves flooding lands at two sites on the Lake bed, one in the northeast near Swansea and one in the southeast about five miles south of Keeler. The water for these sites will be delivered by above-ground pipelines. The north site pipeline will come from a well near the Owens River Delta. The southern pipeline will come from the Mill Well in Section 15, T17S R38E, south of Keeler. The north area to be flooded and traversed by the pipeline is presently devoid of vegetation. The southern test site has little or no vegetation, but the pipeline feeding it may cross areas of alkaline meadow or drier salt-tolerant scrub vegetation as noted above. Most of this vegetation, particularly alkaline meadow, has been previously degraded or destroyed by cattle grazing.

The species that dominate the three communities around Owens Lake are found throughout the Owens Valley, the Northern Mojave Desert and the Western Great Basin. Although they may be infrequent around the saline environments of Owens Lake, none of the species found in the communities are unique in the region.

Sensitive Plants

From a review of records (12/01/91) in the Natural Diversity Data Base (NDDB) of the California Department of Fish and Game, three sensitive plant species have been identified as potentially occurring with the project area:

1. Owens Valley Checkerbloom (Sidalcea covillei)
   State Endangered; Federal Candidate 2; CNPS List 1B
   Habitat: Moist alkaline meadows & freshwater seeps, fine sandy loam soil (one occurrence in stoney calcareous soil; 3500-5000 ft.

2. Nevada Oryctes (Oryctes nevadensis)
   Federal Candidate 2; CNPS List 2
   Habitat: Chenopod scrub, mojavean desert scrub; dry sites in loose sandy soil in washes and desert foothills in the Owens Valley; 3600-4000 ft.

3. Inyo County Mariposa Lily (Calochortus excavatus)
   Federal Candidate 2; CNPS 1B
   Habitat: Alkaline meadows; mostly fine, sandy loam with alkaline salts; 4000-6400 ft.

Occurrence of these rare plants in areas which would be affected by the proposed project is unlikely. However, the three species may be observed by various of the field investigations,

including placement of piezometers in Component 3, or during the placement of the pipeline connecting the Mill Well Site to the southern test site in Component One. Disturbance to the above three species will be avoided.

Wildlife

One habitat that has had insufficient study to date is the ponds and springs around the Lake margin. It is possible that various aquatic species live in these environments, isolated from other similar groups by the prehistoric fall of the Lake level and the more recent desiccation of the Lake bed. The current project will not effect the hydrology of any of these springs, and further environmental work will be done before later expansions of any of the bioremediation measures are implemented.

Amphibians are noticeably absent in the project area, as is to be expected in an area with so little water, and much of the water that does exist being so saline. Surveys done in conjunction with earlier projects have found Great Basin Spadefoot Toads (Scaphipus intermontanus) and Red-spotted Toads (Bufo punctatus) in low densities around some of the fresher marginal springs. No amphibians have been seen around the interior sulphate springs.

As might be expected, reptiles are better represented than the amphibians. Several species of both lizards and snakes are known to inhabit the Owens Valley, and most are at least occasional visitors to the Lake bed. Surveys have not been done for reptiles on the Lake bed or around the margins, but the following may be present according to range maps:

Desert Banded Gecko	Coleonyx variegatus
Mojave Zebra-tailed Lizard	Callisaurus draconoides rhodostictus
Desert Iguana	Dipsosarus dorsalis dorsalis
Long-nosed Leopard Lizard	Gambelia wislizenii wislizenii
Southern Desert Horned Lizard	Phrynosoma platyrhinos calidiarum
Western Chuckwalla	Sauromalus obesus obesus
Northern Sagebrush Lizard	Sceloporus graciosus graciosus
Desert Side-blotched Lizard	Uta stanssburiana stejnegeri
Great Basin Western Whiptail	Cnemidophorus tigris tigris
Western Blind Snake	Leptotyphlops humilis
Desert Rosy Boa	Lichanura trivirgata gracia
Western Shovel-nosed Snake	Chionactis occipitalis
Desert Night Snake	Hypsiglena torquata deserticola
Red Coachwhip	Masticophis flagellum piceus
California Kingsnake	Lampropeltis getulus californiae
Desert Striped Whipsnake	Masticophis taeniatus taeniatus
Western Spotted Leaf-nosed Snake	Phuyllorhynchus decurtatus perkinsi
Great Basin Gopher Snake	Pituophis melanoleucus deserticola
Western Long-nosed Snake	Rhinocheilus lecontei lecontei

Mojave Patch-nosed Snake	Salvadora hexalepis mojavensis
Ground Snake	Sonora semiannulata
Western Black-headed Snake	Tantilla planiceps utahensis
Mojave Desert Sidewinder	Crotalus cerastes cerastes
Panamint Speckled Rattlesnake	Crotalus mitchelli stephensi
Mojave Rattlesnake	Crotalus scutulatus

The most easily observable form of animal life in the project area are birds. The marginal springs, shallow ponds from the interior wells and standing water following rainfall events all support a varied collection of shore and water birds. A few small passerine and ground living birds have also been identified around the Lake margins, but not in the quantities of the wetland birds.

Birds actually seen and identified on the Lake bed or around the margins over the last few years include:

Eared Grebe	Podiceps nigricolis
American White Pelican	Pelecanus erythrorhynchos
Snowy Egret	Egretta thula
Green-winged Teal	Anas carolinensis
Mallard	Anas platyrhynchos
Northern Pintail	Anas acuta
Cinnamon Teal	Anas cyanaoptera
Lesser Scaup	Aythya affinis
Old Squaw	Clangula hyemalis
Ruddy Duck	Oxyura jamaicensis
Turkey Vulture	Cathartes aura
Northern Harrier	Circus cyaneus
Gambel's Quail	Lophortyx gambelii
American Coot	Fulica americana
Western Snowy Plover	Charadrius alexandrinus nivosus
Killdeer	Charadrius vociferus
Black-necked Stilt	Himantopus mexicanus
American Avocet	Recurvirostra americana
Lesser Yellowlegs	Totanus flavipes
Willet	Catoptrophorus semipalmatus
Spotted Sandpiper	Actitis macularia
Western Sandpiper	Calidris mauri
Wilson's Phalarope	Phalaropus tricolor
Red-necked Phalarope	Phalaropus lobatus
California Gull	Larus californicus
Common Poorwill	Phalaenoptilus nuttallii
Common Raven	Corvus corax
Sage Thrasher	Oreoscoptes montanus
Green-tailed Towhee	Pipilo chlorurus
Black-chinned Sparrow	Spizella atrogularis
Black-throated Sparrow	Amphispeza bilineata
Sage Sparrow	Amphispiza belli
House Finch	Carpodacus mexicanus

Several other sandpiper-type birds pass through the area, as

well as other gull, duck, hawk and falcon species which may be occasional visitors.

The bird of most interest in the project area is the Western Snowy Plover (Charadrius alexandrinus nivosus), discussed below, under "Sensitive Animals".

Information on mammals is scanty. One major study rodents and their habitats done by Matson in 1976 around the Lake bed margins found signs of Antelope Ground Squirrels (Ammospermophilus leucurus) and pocket gophers (Thomomys bottae operarius and T. b. perpes) and live-trapped Perognathus longimembris, Peromyscus crinitus, Perognathus formosus, Peromyscus boylii Dipodomys microps, Onychomys torridus, Dipodomys deserti, Neotoma lepida, Mus musculus, Mojave Panamint Kangaroo Rats (Dipodomys panamintinus mohavensis); Merriam's Kangaroo Rats (Dipodomys merriami), Western Harvest Mice (Reithrodontomys megalotis and deer mice (Peromyscus maniculatus). Generally, population densities were low to very low even after some high precipitation years, indicating that the habitat for these species is only marginal.

In a 1990 survey done by a Great Basin biologist for a previous project on the southern and eastern shoreline area, fewer species and lower counts were found. Ammospermophilus leucurus, Dipodomys merriami, Dipodomys panamintius, Perognathus longimembris, Peromyscus maniculatus, and possibly Dipodomys ordii were identified.

Where there are rodents, there are usually predators, and the Lake margins are no exception, although the densities are probably low, due to the small prey population. Coyote (Canis latrans) and Bobcat (Lynx rufus) have been occasionally seen at the northern and eastern portions of the Lake, while Gray Fox (Urocyon cinereoargenteus) and Kit Fox (Vulpes macrotis) have been seen at the southern end of the Lake. Feral cats also prey on the local rodent population. Skunks, badgers, and several types of bats should be present, but are not documented.

Most of the area's mammal species are either cryptic, nocturnal or present only in an area during certain seasons of the year. Thus field surveys must be rigorous to reveal the real numbers and types of animals present at a given site. With only the one survey previously mentioned, and some recent work done in conjunction with previous projects, data are scarce on the local mammal population.

The northern end of the Lake, around the Owens River, is identified by the BLM as an important Tule elk (Cervus elaphus nannodes) calving area. Tule elk also range around the northwest Lake margins, and occasionally can been seen on the Lake bed itself in the area of the Owens River delta.

Sensitive Animals

From current NDDB records and the digitized data base maintained by the Bureau of Land Management for their Bishop Resources Management Plan program, the following sensitive animal species have been identified as potentially being in the project area:

1. Owens dune weevil (Trigonoscuta owensi)
   Federal candidate 2
   Habitat: Stabilized sand dunes

2. Owens Pupfish (Cyprinodon radiosus)
   State and Federal Endangered
   Habitat: Shallow water habitats in the Owens Valley; warm, clear, shallow water free of exotic fishes; need firm substrate for spawning.

3. Owens Tui Chub (Gila bicolor snyderi)
   State and Federal Endangered
   Habitat: Endemic to the Owens River Basin in variety of habitats; need clear, clean water adequate cover, aquatic vegetation.

4. Western Snowy Plover (Charadrius alexandrinus nivosus)
   California Species of Special Concern
   Habitat (Interior population): Sandy or gravelly substrate for nesting, near shore of alkaline Lakes.

   *Note - The Pacific Coast population of the Western Snowy Plover is proposed for Federal Threatened status, but this does not apply to the interior population.

5. Owens Valley California Vole (Microtus californicus vallicola)
   Federal candidate 2; California Species of Special Concern
   Habitat: Wetlands and lush grassy ground in Owens Valley; needs friable soil for burrowing; clips grass for runways.

The Owens dune weevil is known from several locations in dune areas on the northeastern shore of Owens Lake, near Swansea. These dunes are immediately adjacent to the northern test area of Component One. Other dune areas on the northern shore and around the east side to south of Keeler have been mapped by the BLM as potential habitat for this species.

The Western Snowy Plover is known to nest at Owens Lake. Owens Lake and Mono Lake are the two most important breeding areas for the Plover in California, with Owens Lake having a larger population in surveys done in the 1970's, and Mono Lake having the larger population in surveys done since the mid-1980's. The Plover is a ground-nesting wading bird. It nests on the ground in a shallow scrape, which is well camouflaged by its small size and the light colored birds. Ravens are the most important predators, both of eggs and nestlings. The adults and young feed on brine flies

and their larvae.

Male Snowy Plovers begin arriving in March, and start to establish breeding territories. If forced to move, it is likely they will abandon breeding for that season. The young become independent enough to leave the nesting site by mid-to late September. The breeding season coincides with the period when the Lake bed surface is most stable and construction must carried out. Observations by GBUAPCD staff trained in recognition of the Plover nesting sites have found them on all parts of the Lake at one time or another.

The Owens Tui Chub and Owens Pupfish are not known to occur in any of the springs or ponds within Owens Lake, and survive only in a few locations. It is highly unlikely that they would occur within any of the project area, but various springs and ponds in and around the Lake could be considered as potential sites for transplanting these fish in the future.

The Owens Valley California Vole occurs in meadow habitats. It has been identified in pasture lands in the southwest shore zone of the Lake. It is possible that this species could be encountered by some of the field investigations or during the placement of the pipeline connecting the Mill Well Site to the southern test site in Component One.

In addition to the above, there has been a single recorded sighting of the Mohave Ground Squirrel (Spermophilus mohavensis), a State and Federal Endangered Species, for a location near Olancha, south of Owens Lake. This would be a major extension of its range from the Mojave Desert, its currently known distribution. It is extremely unlikely that this species would be encountered by the proposed project.

Noise and Visual Resources

Unbroken vistas and silence, except for the wind, are the natural conditions of the site. The Lake bed is almost perfectly flat, and the only visual relief is provided by a trona mining operation and its associated equipment on the western margins of the Lake bed. The mining operation is also the only source of noise. The potential receptors, however, are the small town of Keeler, approximately 10 miles across the Lake bed to the northeast, and Highway 395, approximately 3 miles to the west.

Light and Glare

The sources of light near the project are natural. None come from the mining operations as they are not conducted at night.

Land Use

The mining operation currently exists on the Lake bed. There is some cattle grazing. The nature of the Lake bed surface will prevent agricultural or developmental uses.

Recreation

The Lake bed provides open space and recreational uses such as hunting, bird watching, etc.

Public Services/Utilities

Electrical power service was provided to the River Wells site by LADWP and will be utilized in the wetlands project. No power currencly exists at the Mill Well site. New power lines will have to be run from the lines along Hwy 136 to the well site (approx. ½ mile.

Cultural Resources

There are no historic or prehistoric resources on the Lake bed surface. Native Americans and early settlers did use the Lake shore before the Lake dried up. The margins of the Lake were used extensively by Native Americans, and previous surveys have uncovered many sites with archaeological significance. Owens Lake has been used by man for hunting, boating and food supplies such as brine fly larvae and shellfish. All sites discovered so far are above the 3590 foot contour, just above the late prehistoric shore line. This level can be taken as a threshold, and project components below this line are highly unlikely to encounter sites of significance.

Environmental Impact Assessment Checklist
Discussion of Environmental Evaluation

A. Earth

A1. The project will not result in any unstable earth conditions or changes in geologic substructures. The placing of piezometers in Component 3 will include very shallow test holes, but will not include any major excavations.

A2. Component 2 of the proposed project will result in the creation of sand dunes, which will cover some parts of the playa surface. This is similar is size and scope to the natural dune formation process which occurs on the Lake bed surface, but will cover a larger percentage of the surface.

A3. The creation of dunes in Component 2 will alter the topography of the Lake bed. The naturally occurring dunes have a similar scale of relief.

A4. While the Lake bed itself is a unique geologic feature, the proposed project will not result in any significant changes to the overall surface.

A5. The project will test various methods of controlling wind erosion of the Lake bed surface and subsequently the existing dust problem.

A6. No beach or river sands or channels exist in the project area.

A7. The project is taking place in a seismically active area; however, this project will not expose any additional personnel or equipment to geologic hazards beyond existing levels.

B. Air Quality

B1. This project will not result in any significant additional air emissions. Only a small number of vehicles will be in use at any one time. The proposed project may contribute to the implementation of a control strategy for the fugitive dust problem by providing a test of various control strategies.

B2. The project will not release any odors.

B3. The project will not alter air movement or climate patterns in a significant manner. The dunes created in Component 2 will alter wind movement patterns on the surface of the Lake bed, but only on an insignificant scale.

C. Water

C1. No alterations to any current surface waters are proposed in this project. Component 1 has the potential to create temporary ponds or wetlands on the Lake bed.

C2. The proposed project will map, measure and test the surface runoff waters. Component 1 has the potential to create a slight increase in the runoff on the Lake bed surface.

C3. See C2, above.

C4. The project will not use any surface water but will be a source of additional discharge onto the dry Lake bed surface. The low flows proposed for the Component 1 pilot will be insignificant compared to other sources of water.

C5. See C4, above.

C6. The proposed project will only attempt to measure the rates and direction of flow of any surface waters in Components 3 and 5.

C7. Component 1 will pump water from three existing wells drilled by Great Basin in 1990. While the two wells at the River Site are artesian, they are capped and are not allowed to flow freely. The proposed pumping rates for Component 1 will be based on well yields obtained from short and long term pump tests carried out at the wells in 1990 and 1991. Groundwater aquifers, surface springs and existing wetlands will be monitored before, during and after project pumping to ensure that long and short term pumping will not adversely affect groundwater supplies.

C8. Long term pump tests at Great Basin's Shallow River and Mill Site wells have indicated that there is a very small possibility that excessive groundwater pumping may have an adverse effect on the town of Keeler's water supply. Monitoring wells in the area and Keeler's well will be monitored during pumping to ensure that Keeler's water supply is not threatened. One of the purposes of Component 4 is to expand the understanding of the area's groundwater aquifers so that groundwater resources can be developed without threatening existing water supplies

C9. The proposed project will not expose personnel or facilities to flooding. The flows proposed in Component 1 are too low to produce "flash floods", and the ponding that may result is in an area that is uninhabited.

C10. No known thermal springs will be effected by the project.

D. Plant Life

D1. Most of the Project Components will not involve changes to existing vegetation. Pipeline placement for the south test area in Component 1 may cross some vegetated areas. However, no significant impacts to vegetation is expected. The pipeline will be placed on the ground surface, and access will be kept to the minimum necessary. A biologist will survey the south pipeline route for Component 1 and access roads for all project components in advance and select the least damaging routes. Construction, maintenance, and research crews will be instructed to use designated access routes and minimize any vegetation disturbance.

D2. There is a remote possibility that three sensitive plant

species could be encountered (see Environmental Setting). To avoid the possibility of impacts, all moist alkaline grassland areas which could be affected by any construction, access roads, piezometer placement, or other investigative procedure will be surveyed in advance by a biologist. As noted above, the entire pipeline route for the southern test site will be surveyed. Impacts to any sensitive species will be avoided.

D3. No new plant species will be introduced into the area by the project. Component 1, northern test site, will involve some planting but only materials from locally-adapted native species will be used. Greenhouse tests in Component 6 will also only use local native plants.

D4. No agricultural areas are included in the project area. Some cattle grazing does occur.

E. Animal Life

E1. No significant adverse impacts to wildlife are expected. As noted above, only minimal affects on vegetated areas is expected. Construction, maintenance, and research personnel will be instructed to avoid any disturbance to wildlife, including the Tule elk and water birds, encountered while in the field.

E2. The Owens dune weevil is known from several locations in dune areas on the northeastern shore of Owens Lake, near Swansea. These dunes are immediately adjacent to the northern test area of Component One. Other dune areas on the northern shore and around the east side to south of Keeler have been mapped by the BLM as potential habitat for this species.

Access to all of the Project Components will be selected in advance to avoid any new disturbance to dune areas. Construction, maintenance, and research personnel will be instructed to use only designated routes, thus avoiding impacts to the dune weevil.

The Owens Tui Chub and Owens Pupfish are not known to occur in any of the springs or ponds within Owens Lake. None of the project components will affect springs in and around the Lake which could be considered as potential sites for transplanting these fish in the future.

The Western Snowy Plover is known to nest in all parts of Owens Lake. Male Snowy Plovers begin arriving in March, and start establishing breeding territories. If forced to move, it is likely they may abandon breeding for that season. The young become independent enough to leave the

nesting site by mid-to late September. The breeding season coincides with the period when the Lake bed surface is most stable and construction must be carried out. It will be impossible for all project components to completely avoid nesting areas. Any particular line of access to a project would have only limited potential to intersect a nest site since Snowy Plover nests are typically widely and sparsely distributed over a large area.

During previous similar remediation tests carried out by the GBUAPCD, trained survey staff were able to mark out routes free of Plover nests for the major routes to and from the project sites. This mitigation, to be carried out by a trained biologist, it incorporated into this pilot as well, and will greatly reduce the impact on the Snowy Plovers.

Along the individual pilot transects, dune fences and pipelines, all construction, maintenance, and research crews will be briefed on the Plover's presence and habits. Disturbance of Snowy Plover behavior and habitat, in particular, nesting sites, will be avoided as much as possible. Over the course of the three years that parts of the project will be in operation, it is anticipated that some minor impacts may still occur, affecting the resident Plovers, primarily the disturbance of a few nesting individuals. This impact is not considered significant, due to the small numbers affected, the large area of the Lake unaffected, and the overall improvement to the Plover habitat which can result from the implementation of a full remediation plan.

The Owens Valley California Vole occurs in meadow habitats. It has been identified in pasture lands in the southwest shore zone of the Lake. It is remotely possible that this species could be encountered by some of the field investigations or during the placement of the pipeline connecting the Mill Well Site to the southern test site in Component One. Surveys to avoid vegetation disturbance as noted in D. above will reduce impacts to this species. Areas that have already received substantial habitat damage via cattle trampling will receive only cursory surveying. Prior to placing the pipeline or locating any test equipment in grassy areas, a biologist will examine the area for signs of burrow or runway activity. Any areas of dense vole population discovered will be avoided, thus eliminating the potential for any significant adverse impact.

E3. No new species will be introduced into the area.

E4. The habitat provided by the project site is hostile to most animal life, a circumstance which will not be changed significantly by the project. Habitat suitable for waterfowl and shorebirds may be slightly improved by the discharges from Component 1, however this may only be a temporary condition.

F. Noise

F1. This project will not generate significant additional noise. The installation of Components 1,2,3 and 7 will be a source of intermittent light equipment noise during the daylight hours, but the nearest receptors are too far away (3-10 miles), for the effect to be noticeable.

F2. The project will not subject anyone to severe noise levels. The project will only generate noise during the installation period.

G. Light and Glare

G1. The proposed project will not result in nighttime lighting in the area.

H. Land Use

H1. No alteration of land use is proposed by or will result from this project.

I. Natural Resources

I1. Component 1 will temporarily increase the rate of renewable natural resource use. Water from all three wells will be pumped in excess of natural flow rates. Flow rates from each of the three wells is expected to be in the range of 3.5 to 4.5 cubic feet per second.

I2. The project will not deplete any nonrenewable resources.

J. Risk of Upset

J1. The proposed project does not pose any risk of upset.

J2. The project will not interfere with any emergency response plan as none exists due to the fact that the area is without population or facilities subject to such a plan.

K. Population

K1. The project will not effect the area's population characteristics since it is does not propose any changes

to the existing personnel involved in current operations.

L. Housing

L1. The project will not bring any new, permanent residents into the area, and will not generate any demand for temporary housing (See K1, above).

M. Transportation

M1. Some additional traffic will be generated by this project. During the construction and monitoring period of the pilot small numbers of four-wheel drive vehicles will be using the Lake bed surface, and the roads around the Lake.

M2. The project will not generate any additional parking demand over the current levels.

M3. See M1.

M4. No transportation patterns now in existence will be altered by this project.

M5. See M4, above.

M6. The project will not increase any traffic hazards to ground transportation modes since no significant changes in traffic will result.

N. Public Services

N1. The project will not affect fire services since it takes place on the dry Lake bed, which is devoid of flammable materials.

N2. The project will not affect police services above present levels.

N3. The project will not have additional effects on schools since it will not add any personnel to the area.

N4. The project will not require any changes in recreational facilities beyond existing levels because no new personnel will result from the proposed project.

N5. No additional maintenance for public facilities will be required due to the project.

N6. The project will not affect any governmental services.

O. Energy

O1. This project will not use any significant additional fuel or energy. During construction and monitoring operations, four-wheel drive vehicles and some light equipment will be used on the Lake surface.

O2. The project will not require any new sources of fuel, or make any new demands on existing sources.

P. Utilities

P1. The project will use electric power for the operation of the three pumps proposed in Component 1.

P2. Normal radio and telephone communications systems, presently in use, will continue at existing levels.

P3. The project will not use any public water systems.

P4. The project will not use public sewer systems. Portable toilets will be used for the project personnel.

P5. The project takes place on a dry Lake bed and storm waters are typically absorbed into the bed.

P6. The project will not generate any solid waste above existing levels.

Q. Human Health

Q1. The project will not create or expose any personnel to health hazards.

Q2. The project will not expose anyone to any additional health hazards other than the dust levels currently existing on the Lake bed.

R. Aesthetics

R1. This project will not change any current views, other than the possibility of the creation of small ponds in Component 1, the test dunes in Component 2 and the intermittent use of vehicles on the Lake surface. The scale of these changes and the distance to receptors makes this impact insignificant.

S. Recreation

S1. The project takes place in an area, Owens Dry Lake, that is used for recreational purposes such as hunting and bird watching. These uses will not be impacted.

T. Cultural Resources

T1. No prehistoric or historic sites ever existed on Lake bed itself. Sites on the Lake margins will be avoided by installing the components of the project below the 3590 foot contour.

T2. The project will not effect any historic or prehistoric building, structure or object.

T3. The project does not have any potential to cause physical changes that would effect any unique ethnic cultural values.

T4. The project will not effect any religious or sacred use of the project area.

U. Mandatory Findings of Significance

U1. The project will not degrade the environment in any significant way. It is a small-scale set of pilot projects designed to test the feasibility of dust mitigation strategies. The project has the potential to temporarily enhance the wetland values of the Lake bed.

U2. The project as defined, will not have any significant short- or long-term environmental effects. After the test period the agencies involved will have to decide on a long term mitigation plan to reduce the health hazards posed by dust from Owens Lake. This larger scale project will require further environmental documentation.

U3. There is a possibility of one other project being undertaken within the relative time frame of the proposed project. This is a proposal for the expansion of the mining operations currently taking place on the western part of the Lake, under lease to the State Lands Commission. The County of Inyo will be the CEQA Lead Agency if this project is undertaken.

U4. The proposed project will not have any environmental effects which will cause adverse effects on human beings, directly or indirectly as discussed in the preceding sections.

MITIGATION MONITORING PLAN
PROPOSED DUST REMEDIATION PILOT PROGRAM
OWENS LAKE

1. Impact: Potential impacts to sensitive plant and animal species.

   Project Modification:

   a. Access for each project component will be surveyed in advance by a qualified biologist for sensitive plant and animal species. Routes will be selected which avoid disturbance to sensitive plants and animals and their habitats. All construction, maintenance and research personnel will be required to use only the designated routes.

   b. Construction, maintenance and research personnel will be instructed to avoid any direct disturbance to wildlife, including the Tule Elk and water birds, encountered while in the field. Workers will be briefed on Snowy Plover presence and habits and instructed to avoid disturbing individuals, particularly those nesting. All active plover nests will be reported to CDFG and impacts avoided.

   c. All moist, alkaline grassland areas which could be adversely affected by any construction, maintenance, or research activity will be surveyed in advance by a qualified biologist with the intent to identify means of avoiding habitat disturbance. Such areas that have already received substantial habitat damage via cattle trampling will receive only cursory surveying. Any grassy areas found to have signs of vole burrows or runway activity indicating a significant population will be avoided.

   d. Dune areas adjacent to Component 1 have been identified as potential habitat for the Owens Valley Dune Weevil. Access to all of the project components will be selected in advance to avoid any new disturbance to dune areas. Construction, maintenance, and research personnel will be instructed to use routes which avoid impacts to the dune weevil.

   Monitoring: Great Basin Unified Air Pollution Control District will be responsible for the implementation of these mitigation measures for their Project Components (nos. 1, 3, 4, 5, 7 and 8) and the University of California will be responsible for the implementation of these mitigation measures for the Sand Dune Array Test, Vegetation Research, and Pre-bioremediation Engineering Studies Project Components (nos. 2, 6, 9).

EXHIBIT D

3.75" = 1 MILE
(from GBUAPCD PHOTO 4/8/92

N

EXISTING DUNES

NEW BLOCK ARRAY - 1992

LAKE MINERALS ROAD

NOAA SITE

LINEAR ARRAYS 1992-1993

(NOTE - NOT SHOWN RANDOMIZED)

RIPARIAN ARRAY (92-D)

DIRTY SOCKS NATURAL SAND DUNES

TASK 92-E

+ ADDENDUM

DIRTY SOCKS WELL

EXHIBIT "E"

MEMORANDUM OF AGREEMENT
BETWEEN THE STATE LANDS COMMISSION AND THE
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT FOR
DUST ABATEMENT ON OWENS LAKE

The California State Lands Commission (hereinafter referred to as "Commission"), and the Great Basin Unified Air Pollution Control District (hereinafter referred to as "District"), enter into this Memorandum of Agreement (hereinafter referred to as "MOA"), on this _____ day of May, 1992 as follows:

I. RECITALS

1. WHEREAS, the Commission has exclusive jurisdiction over all navigable rivers, streams, and lakes, and is responsible for the protection and promotion of public trust values related to such bodies of water;

2. WHEREAS, Owens Lake in Inyo County (hereinafter referred to as "Owens Lake"), was historically a navigable lake and under the jurisdiction of the Commission;

3. WHEREAS, the District is an agency with jurisdiction over the implementation of emission limitations, rules, regulations, and enforcement procedures to maintain State and Federal ambient air quality standards in the Owens Valley;

4. WHEREAS, for many years the Commission and the District have met and joined together to study various means to mitigate the dust storms which arise on the bed of Owens Lake;

5. WHEREAS, in July, 1987, the United States Environmental Protection Agency (EPA) promulgated new ambient air quality standards for particulate matter less than 10 microns in diameter (PM-10);

6. WHEREAS, on August 7, 1987, the EPA identified the Owens Valley between Tinemaha Reservoir and Haiwee Reservoir as an area which violated the EPA PM-10 standards;

7. WHEREAS, the Federal Clean Air Act requires that a State Implementation Plan (SIP) be drawn up to verify the violations, identify the source of the PM-10 violations, and show how those sources will be controlled so that violations will no longer occur;

8. WHEREAS, pursuant to the mandate of the Federal Clean Air Act, the District in 1988 prepared a SIP for the Owens Lake;

9. WHEREAS, beginning in 1989, the District has secured funding from the California State Legislature for use in dust control projects on the Owens Lake;

10. NOW THEREFORE, the Commission and District now intend to further cooperate together to undertake dust mitigation projects to explore and develop methods and means to bring the ambient air qualities in the vicinity of the Owens Lake into compliance with the Federal Clean Air Act.

(ADDED pgs. 400-400.7)

CALENDAR PAGE 400
MINUTE PAGE [illegible]

II. THE PROJECT

11. The overall goal of the Commission and the District is to reduce the PM-10 particulate arising from the bed of Owens Lake and to promote the establishment of public trust values on the lake bed. In order to achieve these goals, the Commission and the District agree to work cooperatively and to assist each other in the implementation of various components of the work to be performed. To date, the Commission and the District has identified nine projects to be undertaken in fiscal year 1992-93. These projects described in paragraphs 12 and 13 below, are collectively referred to as the "Project".

12. The University of California at Davis, California, (hereinafter referred to as "University"), under the direction of Robert Flocchini and Thomas Cahill, has drawn up a proposal for research and development of a dust mitigation project for Owens Lake. The proposal, known as the "Sand Dune Array Mitigation Test", consists of a bioremediation effort based on sand fences and dune fields. The Commission shall enter into a separate agreement with the University for implementation of the Sand Dune Array Mitigation Test. The District shall enter into a separate agreement with the Commission, pursuant to District contract, for the Commission to provide the District with research and developments data from the Sand Dune Array Mitigation Test.

13. The District has identified eight (8) additional projects related to dust abatement on the Owens Lake bed which it intends to implement. The projects are:

A. Owens Lake Wetlands Dust Mitigation Test;
B. Owens Lake Shallow Groundwater Investigation;
C. Owens Lake Deep Aquifer Investigation;
D. Surface Water Investigation;
E. Owens Lake Vegetation Research;
F. Aeolian Transport Study;
G. Continued Physical Characterization of the Owens Lake Bed; and
H. Pre-Mitigation Engineering Investigations.

These individual projects are more specifically described in a document entitled "Owens Lake Dust Mitigation Project Proposals for Fiscal Year 1992-93", dated February, 1992 and produced by the District. Except as provided in Section III and IV below, funding and implementation of these individual projects will be provided for by the District. However, the District, in its sole discretion, may enter into separate agreements, pursuant to District contract, for the Commission to provide some or all of the work or services necessary to complete some or all of these eight individual projects.

14. The Commission and the District concur that each, singularly or jointly, may engage in other activities tangential to the Project according to the dictates and policies of each agency. However, if

either the Commission or the District decides to engage in an activity which may reasonably effect the Project, the new activity shall be coordinated with the Project so as to minimize any adverse consequences to either the District, Commission, or the Project.

III. CONSIDERATION

15. The State Legislature has appropriated $150,000 to the Commission for use by the District in dust mitigation activities on Owens Lake during the period July 1, 1991 - June 30, 1992, the third year of the Owens Lake Dust Control Project. The District hereby agrees to release this money to the Commission for its use in implementing the Sand Dune Array Mitigation Test.

16. The City of Los Angeles Department of Water and Power by separate contract with the District, has paid District $50,000 for it to develop methods and means to bring the ambient air quality in and around the Owens Lake into compliance with the Federal Clean Air Act. The District, hereby, agrees to contract with Commission, pursuant to District contract for $50,000, for the Commission to provide the District with the research and development data from the San Dune Array Mitigation Test.

17. The Commission hereby agrees to provide, at no cost to the District, sufficient acreage in and about the Owens Lake to implement the Project and to implement the establishment of public trust values; provided, however, that the availability of such lands shall be subject to prior existing rights granted by the Commission to other parties.

18. The Commission agrees to use its best efforts to obtain the quit claim of lake bed acreage currently under lease to Lake Minerals Corporation which has been identified as necessary for the Sand Dune Array Mitigation Test. However, the District acknowledges that the Commission cannot compel lake minerals to grant such a quitclaim.

19. Except as expressly provided above, neither Commission or District will be entitled to any additional consideration or compensation from each other.

IV. WORK TO BE PERFORMED

20. The Commission and District shall form a Management Team which shall be responsible for the overall coordination of the Project.

21. The Commission and District shall invite representative from the University, other State, local, and private groups to join the Owens Lake Advisory Group.

22. The Commission shall provide all administrative, contract, legal review, and environmental documentation preparation services necessary for the Sand Dune Array Mitigation Test.

23. The Commission shall be responsible for environmental document preparation services, to include the preparation of an Initial Study and a Negative Declaration, if such document is appropriate, for the projects described in Paragraph 13 of Section II, above. The environmental document services provided by Commission pursuant to this paragraph shall not include the cost or preparation of a Environmental Impact Report (EIR) or the Department of Fish and Game Environmental Review Cost.

V. GENERAL PROVISIONS

24. TERM:

This MOA shall be effective upon its execution and approval by the State and the District, and shall continue in full force until June 30, 1997, unless sooner terminated as provided in the MOA.

25. STATUS OF PARTIES:

The acts of Commission, its agents, officers, and employees relating to the performance of this MOA, shall not be performed as agents, officers, or employees of District. The acts of District, its agents, officers, or employees, relating to the performance of this MOA, shall not be performed as agents, officers, or employees of Commission. Commission, by virtue of this MOA has no authority to bind or incur any obligation on behalf of District. District by virtue of this MOA, has no authority to bind or incur any obligation on behalf of Commission. Commission has no authority or responsibility to exercise any rights or powers vested in District. District has no authority or responsibility to exercise any rights or power vested in Commission. No agent, officer, or employee of the District is to be considered an employee of the Commission. No agent, officer, or employee of the Commission is to be considered an employee of the District. It is understood by both Commission and District that this MOA shall not under any circumstances be construed or considered to create an employer-employee relationship, a joint venture, or a joint powers agreement, however construed. As independent parties to this MOA, each party shall:

A. Determine for itself the methods, details, and means of performing the work or services it has committed to provide under this MOA;

B. Shall be responsible only for the requirements and results specified in this MOA, and except as expressly provided in this MOA, or in any contract executed pursuant to this MOA, shall not be subjected to the other party's control with respect to its action or activities in fulfillment of this MOA; and

C. Shall represent itself, its agents, officers, and employees as such and not as agent, officers, employees, or representatives of the other party.

26. TERMINATION:

This MOA may be terminated by either party without cause, and at will, for any reason by giving to the other party sixty (60) days written notice of such intent to terminate.

27. FUNDING LIMITATION:

The ability of the Commission and District to enter into this MOA is based upon available funding from various sources. In the event that such funding fails, is reduced, or is modified, from one or more sources, the Commission and District each has the option to cancel, reduce, or modify this MOA, or any of its terms within ten (10) days of its notifying the other party of the cancellation, reduction, or modification, of the available funding. Any reduction or modification of this MOA made pursuant to this provision, must comply with the requirements of paragraph 28.

28. AMENDMENT:

This MOA may be modified, amended, changed, added to, or subtracted from, by the mutual consent of the parties hereto, if such MOA or change is in written form and executed with the same formalities as this MOA, and attached to the original MOA to maintain continuity.

29. NOTICE:

Any notice, communication, amendments, additions, or deletions, to this MOA, including change of address of either party during the term of this MOA, which Commission or District shall be required, or may desire, to make, shall be in writing and may be personably served, or sent by prepaid first class mailed to, the respective parties as follows:

DISTRICT: Great Basin Unified Air Pollution Control District
157 Short Street, Suite 6
Bishop, California 93514

COMMISSION: State Lands Commission
1807 13th Street
Sacramento, California 95814

30. DESIGNATION OF PROJECT REPRESENTATIVE:

The Commission and District hereby name a representative to the management team who shall represent his or her agency during the term of this MOA. Each agency may change its representative by notifying the other agency as provided for in Paragraph 28.

COMMISSION'S REPRESENTATIVE SHALL BE:
Steve Sekelsky

DISTRICT'S REPRESENTATIVE SHALL BE:
Ted Schade

31. LIMITATIONS AND RESTRICTIONS:

This MOA is subject to any restrictions, limitations, or conditions enacted by the State Legislature or the Board of the Great Basin Air Pollution Control District, and contained in any budget or statute, regulation, ordinance, or directive enacted by the State Legislature or the Board of the Great Basin Unified Air Pollution Control District.

32. ENTIRE AGREEMENT:

This MOA contains the entire agreement of the parties, and no representations, inducements, promises, or agreements otherwise between the parties not embodied herein or incorporated herein by reference, shall be of any force and effect. Further, no term or provision hereof may be changed, waived, discharged, or terminated, unless the same be in writing executed by the parties hereto.

IN WITNESS THEREOF, THE PARTIES HERETO HAVE SET THEIR HANDS AND SEAL THIS _____ DAY OF _____, 1992.

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT:	STATE LANDS COMMISSION:
By:_____	By:_____
APPROVED AS TO FORM AND LEGALITY:	APPROVED AS TO FORM AND LEGALITY:
_____	_____
District Counsel	Staff Counsel

RELEASE OF LEGISLATIVE FUNDS

1. The California State Legislature has designated $150,000 from the Environmental License Plate Fund for the mitigation of dust in the Owens Valley. The funds were placed in the budget of the State Lands Commission (Commission).

2. The Commission and the Great Basin Unified Air Pollution Control District (District) have entered into a Joint Powers Agreement for the Provision of Research and Development Services (Agreement). The purpose of such Agreement is the construction and study of sand dune arrays on Owens Lake as a means to control dust arising from the lake bed.

3. The Commission will contract with the University of California at Davis, California (University) for the construction of and research on the sand dunes.

4. **NOW, THEREFORE,** the District releases to the Commission whatever right, entitlement and interest it may have in the $150,000 provided by the California State Legislature through the Environmental License Plate Fund.

Date:_________________________

Great Basin Unified Air Pollution Control District

By:___________________________

Approved As To Form And Legality:

____

District Counsel

RELEASE OF LEGISLATIVE FUNDS

1. The California State Legislature has designated $150,000 from the Environmental License Plate Fund for the mitigation of dust in the Owens Valley. The funds were placed in the budget of the State Lands Commission (Commission).

2. The Commission and the Great Basin Unified Air Pollution Control District (District) have entered into a Joint Powers Agreement for the Provision of Research and Development Services (Agreement). The purpose of such Agreement is the construction and study of sand dune arrays on Owens Lake as a means to control dust arising from the lake bed.

3. The Commission will contract with the University of California at Davis, California (University) for the construction of and research on the sand dunes.

4. **NOW, THEREFORE,** the District releases to the Commission whatever right, entitlement and interest it may have in the $150,000 provided by the California State Legislature through the Environmental License Plate Fund.

Date:_____

Great Basin Unified Air Pollution Control District

By:_____

Approved As To Form And Legality:

_____
District Counsel

EXHIBIT "F"

**JOINT POWERS AGREEMENT BETWEEN
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
AND STATE OF CALIFORNIA, STATE LANDS COMMISSION
FOR THE PROVISION OF
RESEARCH AND DEVELOPMENT SERVICES**

INTRODUCTION

WHEREAS, the Great Basin Unified Air Pollution Control District (hereinafter referred to as "District") has the need for the Research and Development services of the State of California State Lands Commission (hereinafter referred to as "State"), and in consideration of the mutual promises, covenants, terms, and conditions hereinafter contained, the parties hereby agree as follows:

TERMS AND CONDITIONS

1. **SCOPE OF WORK:**

The State shall furnish to the District, those services and work set forth in Attachment A, attached hereto and by reference incorporated herein.

Services and work provided by the State under this Agreement will be performed in a manner consistent with the requirements and standards established by applicable federal, state, and County laws, ordinances, regulations, and resolutions. Such laws, ordinances, regulations, and resolutions include, but are not limited to, those which are referred to in this Agreement.

2. **TERM:**

The term of this Agreement shall be from May 1, 1992 to April 30, 1995 unless sooner terminated as provided below.

3. **CONSIDERATION:**

A. Compensation.

District shall pay State in accordance with the Schedule of Fees (set forth as Attachment B) for the services and work described in Attachment A which are performed by State.

B. Travel and per diem.

Costs of all travel and per diem which State incurs in providing services and work under this agreement are included

(ADDED pgs. 401-401.24)

CALENDAR PAGE 401
MINUTE PAGE 1965

in the compensation to be paid to State in the Schedule of Fees (Attachment B). State will not be entitled to any additional compensation for travel expenses or per diem incurred by State in performing this Agreement.

C. No additional consideration.

Except as expressly provided in this Agreement, State shall not be entitled to, nor receive, from District, any additional consideration, compensation, salary, wages, or other type of remuneration for services rendered under this Agreement. Specifically, State shall not be entitled, by virtue of this Agreement, to consideration in the form of overtime, health insurance benefits, retirement benefits, disability retirement benefits, sick leave, vacation time, paid holidays, or other paid leaves of absence of any type or kind whatsoever.

D. Limit upon amount payable under Agreement.

The total sum of all payments made by the District to State for services and work performed under this Agreement, shall not exceed $50,000.00 (hereinafter referred to as "contract limit"). District expressly reserves the right to deny any payment or reimbursement requested by State for services or work performed which is in excess of the contract limit.

E. Billing and payment.

Billing and Payment will be in accordance with the Schedule of Fees (set forth as Attachment B).

F. Federal and State taxes.

(1) District will not withhold any federal or state income taxes or social security from any payments made by District to State under the terms and conditions of this Agreement.

(2) District has no obligation to withhold any taxes or payments from sums paid by District to State under this Agreement. Payment of all taxes and other assessments on such sums is the sole responsibility of State. District has no responsibility or liability for payment of State's taxes or assessments.

4. WORK SCHEDULE:

State's obligation is to perform, in a timely manner, those services and work identified in Attachment A. State will coordinate with District to insure that all services and work will be performed within the time frame set forth by District.

5. **REQUIRED LICENSES, CERTIFICATES, AND PERMITS:**

State will be responsible for ensuring that any licenses, certificates, or permits required by the federal, state, county, or municipal governments for the services and work described in attachment A, are procured and valid at the time State begins performance of this Agreement. Further, during the term of this Agreement, State must ensure that such licenses, certificates, and permits remain in full force and effect. Licenses, certificates, and permits may include, but are not limited to, driver's licenses, professional licenses or certificates, and business licenses. Such licenses, certificates, and permits will be procured and maintained in force at no expense to the District. State will provide District, upon beginning performance of this Agreement, with evidence of current and valid licenses, certificates and permits which are required to perform the services identified in attachment A. Where there is a dispute between State and District as to what licenses, certificates, and permits are required to perform the services and work identified in attachment A, District reserves the right to make such determinations for purposes of this Agreement.

6. **OFFICE SPACE, SUPPLIES, EQUIPMENT, ETC:**

State shall provide such office space, supplies, equipment, vehicles, reference materials, and telephone service as is necessary for State to provide the services identified in Attachment A to this Agreement. District is not obligated to reimburse or pay State, for any expense or cost incurred by State in procuring or maintaining such items. Responsibility for the costs and expenses incurred by State in providing and maintaining such items is the sole responsibility and obligation of State.

7. **DISTRICT PROPERTY:**

A. Personal Property of District.

Any personal property such as, but not limited to, protective or safety devices, badges, identification cards, keys, etc. provided to State by District pursuant to this Agreement are, and at the termination of this Agreement remain, the sole and exclusive property of District. State will use reasonable care to protect, safeguard and maintain such items while they are in State's possession. State will be financially responsible for any loss or damage to such items, partial or total, which is the result of State's negligence.

B. Products of State's Work and Services.

Any and all compositions, publications, plans, designs, specifications, blueprints, maps, formulas, processes, photographs, slides, video tapes, computer programs, computer disks, computer tapes, memory chips, soundtracks, audio recordings, films, audio-visual presentations,exhibits, reports, studies, works of art, inventions, patents,

trademarks, copyrights, or intellectual properties of any kind which are created, produced, assembled, compiled by, or are the result, product, or manifestation of, State's services or work under this Agreement are, and at the termination of this Agreement remain, the sole and exclusive property of the State. However, State hereby grants to District an irrevocable non exclusive right to use any such products for any District purpose without payment of any further compensation or requirement of prior State approval.

8. **WORKERS' COMPENSATION:**

State shall provide worker's compensation coverage, in the legally required amount, for all State's employees utilized in providing work and services pursuant to this Agreement. By executing a copy of this Agreement, State acknowledges its obligations and responsibilities to its employees under the California Labor Code, and warrants that State has complied and will comply during the term of this Agreement with all provisions of the California Labor Code with regard to its employees. Further, State will ensure that any contractor whom it engages to perform work or services under this Agreement will provide workers' compensation coverage for its employees.

9. **INSURANCE:**

A. General Liability.

State shall procure, and maintain during the entire term of this Agreement, a policy of general liability insurance or a self insurance program which covers all the work and services to be performed by State under this Agreement. Such insurance policy or a self insurance program will have a per occurrence combined single limit coverage of not less than $6,000,000.00. Such policy or a self insurance program will not exclude or except from coverage any of the services and work required to be performed by State under this Agreement. Any policy of insurance will be issued by an insurer authorized to sell such insurance by the State of California, and having at least a "Best's" policyholder's rating of "A" or "A+." District will be named as "an additional named insured" on this policy. State will provide the District with evidence of a self insurance program or a copy of the policy and a certificate of insurance showing the District as "an additional named insured" and indicating that the policy will not be terminated, canceled, or modified without thirty (30) days written notice to the District.

B. Business Auto.

If State utilizes a motor vehicle in performing any of the work or services identified in Attachment A (Scope of Work), State shall cover such vehicle operations by a self insurance program or procure and maintain in force throughout the duration of this Agreement, a business auto liability

insurance policy with minimum coverage levels of $300,000.00 per occurrence, combined single limit for bodily injury liability and property damage liability. The coverage shall include all State owned vehicles and all hired and non-owned vehicles used in performing under this Agreement.

Evidence of a self insurance program or a certificate of insurance shall be provided to the District at least ten (10) days prior to the start of work under this Agreement. Any policy shall contain a provision prohibiting the cancellation or modification of said policy except upon thirty (30) days prior written notice to the District.

C. Professional Liability.

If State or any of its employees is required to be professionally licensed or certified by any agency of the State of California in order to perform any of the work or services identified in Attachment A (Scope of Work), State shall cover such professional liability with a self insurance program or shall procure and maintain in force throughout the duration of this Agreement, a professional liability insurance policy with a minimum coverage level of $1,000,000.00. Evidence of the self insurance program or proof of such insurance shall be provided to District at least ten (10) days prior to the start of any work by State.

10. **STATUS OF STATE:**

All acts of State, its agents, officers, and employees, relating to the performance of this Agreement, shall be performed as independent contractors, and not as agents, officers, or employees of District. State, by virtue of this Agreement, has no authority to bind or incur any obligation on behalf of District. Except as expressly provided in Attachment A, State has no authority or responsibility to exercise any rights or power vested in the District. No agent, officer, or employee of the District is to be considered an employee of State. It is understood by both State and District that this Agreement shall not under any circumstances be construed or considered to create an employer-employee relationship. As an independent contractor:

A. State shall determine the method, details, and means of performing the work and services to be provided by State under this Agreement.

B. State shall be responsible to District only for the requirements and results specified in this Agreement, and except as expressly provided in this Agreement, shall not be subjected to District's control with respect to the physical action or activities of State in fulfillment of this Agreement.

C. State, its agents, officers, and employees are, and at all times during the term of this Agreement shall, represent

and conduct themselves as independent contractors, and not as employees of District.

11. **DEFENSE AND INDEMNIFICATION:**

State shall defend, indemnify, and hold harmless District, its agents, officers, and employees from and against all claims, damages, losses, judgments, liabilities, expenses, and other costs, including litigation costs and attorney's fees, arising out of, resulting from, or in connection with, the performance of this Agreement by State, or State's agents, officers, or employees. State's obligation to defend, indemnify, and hold the District, its agents, officers, and employees harmless applies to any actual or alleged personal injury, death, or damage or destruction to tangible or intangible property, including the loss of use. State's obligation under this paragraph extends to any claim, damage, loss, liability, expense, or other costs which is caused in whole or in part by any act or omission of the State, its agents, employees, supplier, or any one directly or indirectly employed by any of them, or anyone for whose acts or omissions any of them may be liable.

State's obligation to defend, indemnify, and hold the District, its agents, officers, and employees harmless under the provisions of this paragraph is not limited to, or restricted by, any requirement in this Agreement for State to procure and maintain a self insurance program or a policy of insurance.

To the extent permitted by law, District shall defend, indemnify, and hold harmless State, its agents, officers, and employees from and against all claims, damages, losses, judgments, liabilities, expenses, and other costs, including litigation costs and attorney's fees, arising out of, or resulting from, the active negligence, or wrongful acts of District, its officers, or employees.

12. **RECORDS AND AUDIT:**

A. Records.

State shall prepare and maintain all records required by the various provisions of this Agreement, federal, state, and municipal law, ordinances, regulations, and directions. State shall maintain these records for a minimum of four (4) years from the termination or completion of this Agreement. State may fulfill its obligation to maintain records as required by this paragraph by substitute photographs, microphotographs, or other authentic reproduction of such records.

B. Inspections and Audits.

Any authorized representative of District shall have access to any books, documents, papers, records, including, but not limited to, financial records of State, which District determines to be pertinent to this Agreement, for the purposes of making audit, evaluation, examination, excerpts, and

transcripts during the period such records are to be maintained by State. Further, District has the right, at all reasonable times, to audit, inspect, or otherwise evaluate the work performed or being performed under this Agreement.

13. **NONDISCRIMINATION:**

During the performance of this Agreement, State, its agents, officers, and employees shall not unlawfully discriminate in violation of any federal, state, or local law, against any employee, or applicant for employment, or person receiving services under this Agreement, because of race, religion, color, national origin ancestry, physical handicap, medication condition, marital status, age, or sex. State and its agents, officers, and employees shall comply with the provisions of the Fair Employment and Housing Act (Government Code section 12900, et seq.), and the applicable regulations promulgated thereunder in the California Code of Regulations. State shall also abide by the Federal Civil Rights Act of 1964 (P.L. 88-352) and all amendments thereto, and all administrative rules and regulations issued pursuant to said act.

14. **CANCELLATION:**

This Agreement may be canceled by District without cause, and at will, for any reason by giving to State thirty (30) days written notice of such intent to cancel. State may cancel this Agreement without cause, and at will, for any reason whatsoever by giving thirty (30) days written notice of such intent to cancel to District.

15. **ASSIGNMENT:**

State may subcontract this Agreement, or any part of it, with the express written consent of District. State shall not assign any monies due or to become due under this Agreement without the prior written consent of District.

16. **DEFAULT:**

If the State abandons the work, or fails to proceed with the work and services requested by District in a timely manner, or fails in any way as required to conduct the work and services as required by District, District may declare the State in default and terminate this Agreement upon five (5) days written notice to State. Upon such termination by default, District will pay to State all amounts owing to State for services and work satisfactorily performed to the date of termination.

17. WAIVER OF DEFAULT:

Waiver of any default by either party to this Agreement shall not be deemed to be waiver of any subsequent default. Waiver or breach of any provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach, and shall not be

construed to be a modification of the terms of this Agreement unless this Agreement is modified as provided in paragraph twenty-four (24) below.

18. **CONFIDENTIALITY:**

State agrees to comply with the various provisions of the federal, state, and county laws, regulations, and ordinances providing that information and records kept, maintained, or accessible by State in the course of providing services and work under this Agreement, shall be privileged, restricted, or confidential. State agrees to keep confidential all such information and records. Disclosure of such confidential, privileged, or protected information shall be made by State only with the express written consent of the District.

19. **CONFLICTS:**

State agrees that it has no interest, and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of the work and services under this Agreement.

20. **SEVERABILITY:**

If any portion of this Agreement or application thereof to any person or circumstance shall be declared invalid by a court of competent jurisdiction, or if it is found in contravention of any federal, state, or county statute, ordinance, or regulation, the remaining provisions of this Agreement, or the application thereof, shall not be invalidated thereby, and shall remain in full force and effect to the extent that the provisions of this Agreement are severable.

21. **FUNDING LIMITATION:**

A. The ability of District to enter this Agreement is based upon available funding from various sources. In the event that such funding fails, is reduced, or is modified, from one or more sources, District has the option to cancel, reduce, or modify this Agreement, or any of its terms within ten (10) days of its notifying State of the cancellation, reduction, or modification of available funding. Any reduction or modification of this Agreement made pursuant to this provision must comply with the requirements of paragraph twenty-three (23) (Amendment).

B. This agreement shall not be effective until it has been approved by the Department of General Services.

22. ATTORNEY'S FEES:

If either of the parties hereto brings an action or proceeding against the other, including, but not limited to, an action to enforce or declare the cancellation, termination, or revision of the Agreement, the prevailing party in such action or proceeding

shall be entitled to receive from the other party all reasonable attorney's fees and costs incurred in connection therewith.

23. **AMENDMENT:**

This Agreement may be modified, amended, changed, added to, or subtracted from, by the mutual consent of the parties hereto, if such amendment or change is in written form and executed with the same formalities as this Agreement, and attached to the original Agreement to maintain continuity.

24. **NOTICE:**

Any notice, communication, amendments, additions, or deletions to this Agreement, including change of address of either party during the terms of this Agreement, which State or District shall be required, or may desire, to make, shall be in writing and may be personally served, or sent by prepaid first class mail to, the respective parties as follows:

Great Basin Unified Air Pollution Control District
157 Short Street, Suite 6
Bishop, California 93514

State Lands Commission
1807 13th Street
Sacramento, California 95814

25. **DESIGNATION OF PROJECT REPRESENTATIVE:**

The Commission and District hereby name a representative to the management team who shall represent his or her agency during the term of this MOA. Each agency may change its representative by notifying the other agency as provided for in Paragraph 28.

COMMISSION'S REPRESENTATIVE SHALL BE:
Steve Sekelsky

DISTRICT'S REPRESENTATIVE SHALL BE:
Ted Schade

26. **ENTIRE AGREEMENT:**

This Agreement contains the entire agreement of the parties, and no representations, inducements, promises, or agreements otherwise between the parties not embodied herein or incorporated herein by reference, shall be of any force or effect. Further, no term or provision hereof may be changed, waived, discharged, or terminated, unless the same be in writing executed by the parties hereto.

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AGREEMENT BETWEEN
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
AND STATE OF CALIFORNIA, STATE LANDS COMMISSION
FOR THE PROVISION OF
RESEARCH AND DEVELOPMENT SERVICES

IN WITNESS THEREOF, THE PARTIES HERETO HAVE SET THEIR HANDS AND SEALS THIS _____ DAY OF _____, 19 ___.

DISTRICT	State
By:_____	By:_____
Dated:_____	Dated:_____

APPROVED AS TO FORM AND
LEGALITY:

_____
District Counsel

APPROVED AS TO ACCOUNTING
FORM:

_____
County Auditor

ATTACHMENT A

AGREEMENT BETWEEN
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
AND STATE OF CALIFORNIA, STATE LANDS COMMISSION
FOR THE PROVISION
RESEARCH AND DEVELOPMENT SERVICES

TERM:

FROM: May 1, 1992 TO: April 30, 1995

SCOPE OF WORK:

PARTIAL MITIGATION OF PM-10 DUST EPISODES
THROUGH CONTROL OF SALTATING PARTICLES AND REDUCTION OF WIND
SHEAR, 1992-1993

April 28, 1992

TASK 1 - SAND DUNE ARRAY FIELD TESTS

1. Construction

a. 1992 Small-Scale Array

In the summer of 1992, the State Lands Commission (SLC) shall cause to be designed and constructed a small-scale sand dune test array to test the effectiveness of sand dunes and sand fences in controlling sand migration and PM-10 emissions from Owens Lake. The small-scale test array shall be located on the southern portion of the lake near the 1981-82 WESTEC sites (see Figure 3, Pg. 8) and shall contain at least 3900 feet of sand fence arranged in a staggered array covering an area at least 820 feet by 1300 feet. All material purchased and labor contracted shall conform to standard State Lands Commission contracting and bid procedures. SLC or its subcontractor shall establish a construction and data collection field office in the south end of the Owens Valley. The final configuration and location of the small-scale test array and the fence design shall be presented to GBUAPCD for their review and comments prior to any construction.

b. 1993 Large-Scale Arrays

CALENDAR PAGE 401.10
MINUTE PAGE

In the summer of 1993, the SLC or its contractor shall cause to be designed and constructed large-scale sand dune test arrays to test the effectiveness of sand dunes and sand fences in controlling sand migration and PM-10 emissions from Owens Lake. The specific design and location of the large-scale array shall be based on the results of the small-scale test. The array will be designed to reduce sand migration on the southern sand sheet from the Dirty Socks Well wash to the western stream courses. The large-scale test shall contain at least 12,000 feet of sand fence in staggered lines arranged in an array at least 1 mile long (see Figure 3, Pg. 8). However, if the small-scale test show that it is necessary, much larger amounts of fencing may be emplaced. There may also be smaller lines of fences consisting of roughly parallel lines of staggered fences approximately in the same area.

Four linear, staggered arrays will be constructed at locations upwind and downwind of the block array. The purpose of these arrays is to start to set the parameters for spacing arrays at Owens Lake to optimized a sand capture per dollar. Each array will be approximately 4,000 feet long with adequate randomization in length and placement to present a quasi-natural dune field when filled. Spacing between arrays will be roughly 2,600 feet, depending on terrain and earlier tests. All material purchased and labor contracted shall conform to SLC contracting and bid procedures. The final configuration and location of the large-scale test arrays shall be presented for review and comment to the GBUAPCD prior to any construction.

2. Instrumentation

All test arrays shall contain the types and amounts of data collection devices necessary to determine the effectiveness of sand dune arrays at controlling PM-10 emissions. Data to be collected shall include, but shall not necessarily be limited to wind speed, wind direction, air temperature, relative humidity, precipitation, sand movement, air quality (PM-10 levels), surface crust conditions, groundwater levels, groundwater chemistry, soil chemistry, soil surface erosion/deposition, sand dune stratigraphy, sand dune growth rates, and sand dune stability. Instrumentation types, amounts, and locations shall be presented for review and comments to GBUAPCD prior to any equipment purchases.

3. Data Collection

Sufficient manpower resources shall be provided to collect the data necessary to determine the effectiveness of sand dune arrays at reducing PM-10 emissions. In addition to PM-10 related data, data shall also be collected to determine the

effect of sand dune arrays on the shallow groundwater table using piezometers within the dune array. A data collection protocol shall be provided that addresses, in detail, the procedures for collecting the data discussed above. This protocol shall be presented for review and comments to GBUAPCD prior to any construction. GBUAPCD may request raw data for review at any time.

4. Data Analysis

The proper type and amount of data analysis necessary to determine the effectiveness of sand dune arrays at reducing PM-10 emissions shall be conducted. Data analysis shall be conducted as per a data analysis protocol to be developed by SLC or its Contractor and presented for review and comment to GBUAPCD prior to any data collection. Drafts of all data analyses shall be submitted to GB for review and comment.

5. Maintenance

All approved sand fence materials and data collection equipment shall be maintained in working order. All materials and equipment shall be adequately anchored and secured. Upon completion of the test all equipment and material shall be removed from the lake bed and properly disposed of. This includes all sand fence materials if required by SLC.

6. Environmental Mitigation

A Negative Declaration (ND) under the provisions of the California Environmental Quality Act (CEQA) has been issued for this project by SLC. The mitigation measures called for in the approved ND that affect the sand dune project shall be implemented by SLC. Mitigation measure monitoring shall occur as per a monitoring plan to be adopted by SLC. The agency responsible for monitoring shall be decided at a later date.

7. Schedule

The small-scale array fences shall be in place by October 31, 1992. All monitoring equipment for the small-scale test shall be in place and operational by October 31, 1992. Data collection on the small-scale array will continue at least until January 1, 1994. The large-scale array fences and monitoring equipment shall be in place and operational by October 1, 1993. Data collection on the large-scale arrays will continue at least until April 30,1994. For the small-scale array, the quarterly project status reports will be prepared and submitted to GBUAPCD on October 1,1992; January 1, 1993; April 1, 1993; July 1, 1993; and October 1, 1993. A draft data analysis report will be submitted on November 1, 1993 and draft final report will be submitted on January

1,1994. For the large-scale array, the quarterly reports will be submitted on the same schedule, but in 1994 and 1995. A draft data analysis report for the large scale array will be submitted November 1, 1994, and the final report will be submitted on January 1, 1995.

TASK 2 - OPTIMIZED AND ENGINEERING OF SAND FENCE MATERIALS AND DESIGN

1. Analysis of Field Acquired Meteorological Data

   All field acquired meteorological data shall be properly reduced and estimates of surface friction speed and surface roughness shall be provided.

2. Sand Fence Design - Conceptual

   All previous field installations of sand fences on Owens Lake will be examined and reported on. Wind tunnel tests to be conducted per a separate contract will be used to develop the optimum parameters for the sand fence manufacturers, and other sand fence investigators will be conducted.

3. Sand Fence Design - Engineering

   Field and laboratory tests necessary to establish the principle sand fence engineering parameters will be conducted and a sand fence design will be generated. The design parameters to be developed will include: fence height, distance between support posts, post embedment depth, fence porosity, fence post, guy and anchor materials, fence orientation, and fence shape. The location of any field testing to be performed shall be submitted for review and comment to GBUAPCD prior to any field work.

4. Lake Bed Access

   Preliminary investigations regarding provision of all-weather access to all mitigation areas on the lake will be conducted. This will include collection of representative samples of the native soils found on Owens Lake and laboratory stabilization testing.

5. Schedule

   The work described in this task shall be completed by October 15, 1993. All raw data collected can be requested by GBUAPCD at any time. Drafts of all data analysis shall be submitted to GBUAPCD for review and comment.

TASK 3 - NATIVE VEGETATION, SOIL AND WATER SURVEY

1. Study Site Selection

Study areas will be selected and will include natural dune areas and artificial dune areas. These sites will be submitted to GBUAPCD for review and comment prior to initiation of any field work.

2. Species Inventory

A species list will be made for each dune or dune system according to micro habitants present (dune top, dune margin, and interdune depressions). Quantitative data on species present will be developed. This will include, but is not limited to, cross section profiles, percentage cover, and species frequency.

3. Dune Morphology and Composition

Dune height, length, width, and shape will be recorded for each study area. Core samples of selected dunes will be collected and analyzed. Analyses will include, but are not limited to, particle size, pH, electrical conductivity, moisture content, organic matter and sulfate, carbonate, and nitrate levels.

4. Vegetation Composition Analysis

Representative plant samples will be collected and analyzed. Analyses will include, but are not limited to, ions of sodium, calcium, magnesium, chloride, boron, sulfate, and carbonate.

5. Seed Dispersal Study

Seasonal variability of seeds between the barren playa and dune sites and between open areas and beneath vegetation canopies will be compared. Random soil samples will be collected from each type of area of interest, seeds present in the samples will be germinated and identified.

6. Report Preparation

A report will be prepared that addresses the study's main objectives. These include, but are not limited to, qualitative and quantitative descriptions of dune vegetation on and around the playa, and comparisons of these species compositions with the surrounding non-dune salt bush communities. The report will also describe the

physical and chemical characteristics of sand dunes as they bear upon vegetation, and determine any correlation between species composition and dune characteristics. The report will also investigate the seeds and seed dispersal on and around the playa.

7. Schedule

The work described in this task shall be completed by October 15, 1993. All raw data collection may be requested at any time by the GBUAPCD. Drafts of all data analyses shall be submitted to GB for review and comment.

COST BY TASK

Large and Small Scale

Task 1 - Sand Dune Array Field Test

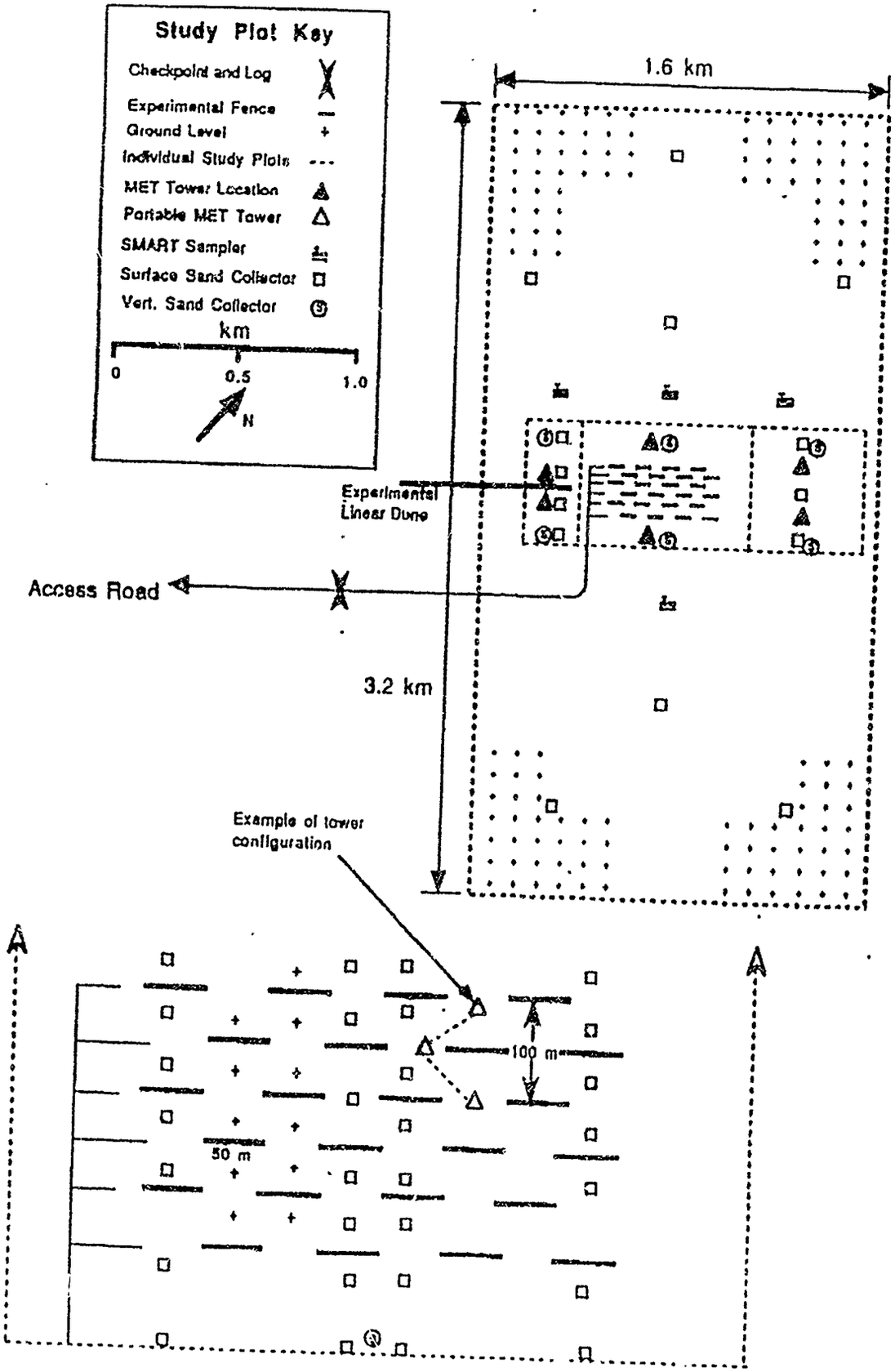
1. Personnel	$36,000
2. Equipment**	$ 5,200
3. Subcontractors	
a. Fencing materials	$46,000
b. Construction labor	$28,000
4. Travel	$ 9,000
5. Supplies, Dust analysis	$ 8,000
Total, Task 1	$132,200

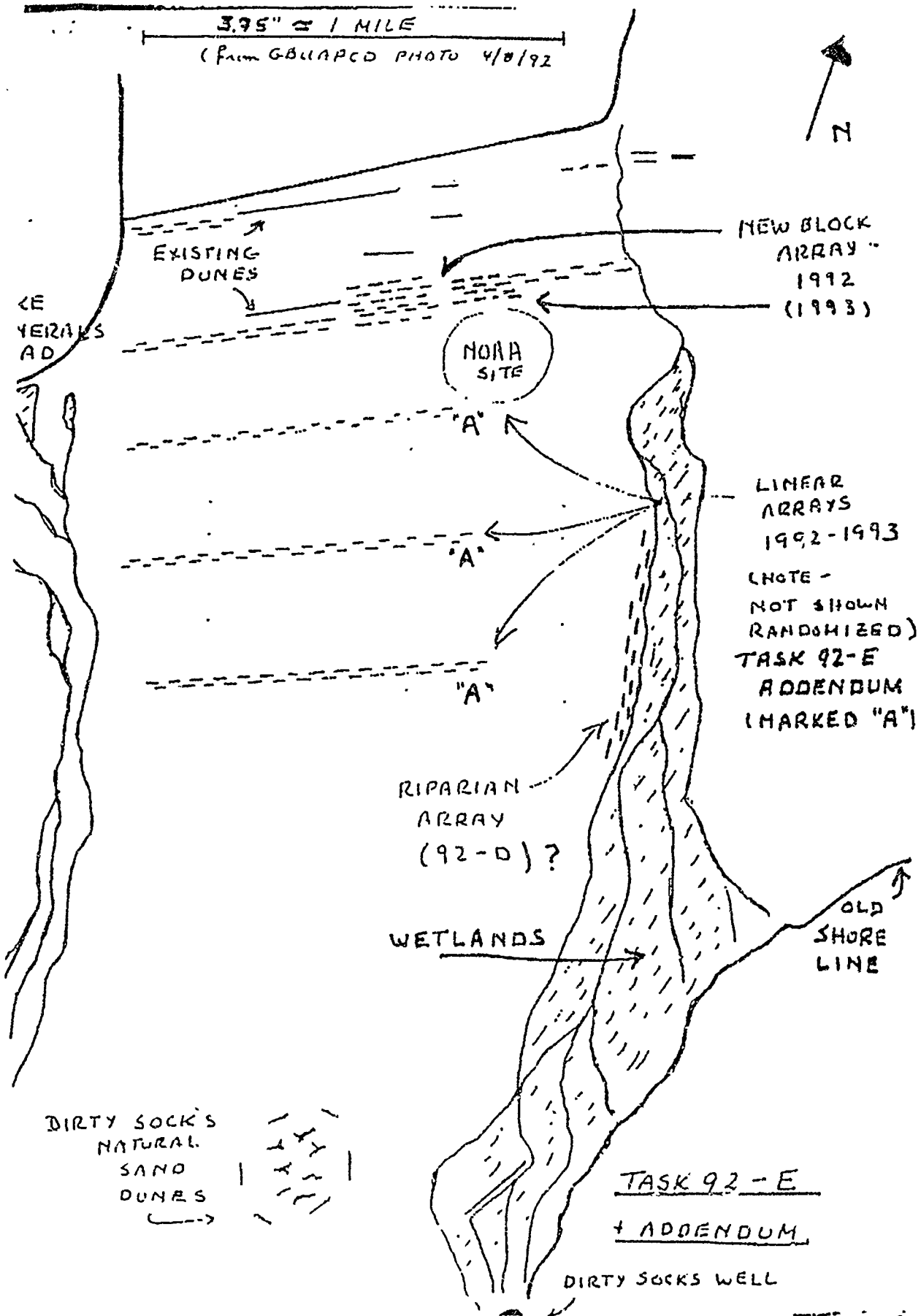
Task 2 - Optimization and Engineering

1. Personnel	$22,000
2. Equipment	-0-
3. Subcontractors	
a. Fencing materials	$ 3,000
b. Construction labor	$ 3,000
4. Travel	$ 2,500
5. Supplies	$ 3,087
Total, Task 2	$33,587

Task 3 - Nature Vegetation

1. Personnel	$ 6,000
2. Travel	$ 2,500
3. Supplies	$ 2,500
Total, Task 3	$11,000
TOTAL OF ALL TASKS	$176,787
Coordination - State Lands Commission	$ 6,500
TOTAL DIRECT COSTS	$187,287
Indirect Costs (Items ** not subject to Indirect Costs)	
10% of 167,087 = $16,709	$16,709
PROJECT TOTAL	$199,996


Study Plot Key
Checkpoint and Log
Experimental Fence
Ground Level
Individual Study Plots
MET Tower Location
Portable MET Tower
SMART Sampler
Surface Sand Collector
Vert. Sand Collector
km
0
0.5
1.0
N
1.6 km
Experimental Linear Dune
Access Road
3.2 km
Example of tower configuration
100 m
50 m


3.75" = 1 MILE
(from GBUAPCD PHOTO 4/8/92
N
EXISTING DUNES
NEW BLOCK ARRAY - 1992 (1993)
NORA SITE
"A"
"A"
"A"
LINEAR ARRAYS 1992-1993
(NOTE - NOT SHOWN RANDOMIZED)
TASK 92-E ADDENDUM (MARKED "A")
RIPARIAN ARRAY (92-D)?
WETLANDS
OLD SHORE LINE
DIRTY SOCK'S NATURAL SAND DUNES
TASK 92-E
+ ADDENDUM
DIRTY SOCKS WELL

BUDGET SUMMARY

DIRECT COSTS:

1.	Labor	$56,544	
2.	Subcontractors/Consultants	30,000	
3.	Equipment	6,500	
4.	Travel & Subsistence	5,200	
5.	Electronic Data Processing	13,920	
6.	Reproduction & Publication	1,500	
7.	Mail & Telephone	1,000	
8.	Materials & Supplies	54,595	
9.	Analyses	2,300	
10.	Micscellaneous	4,500	
	Total Direct Cost	176,059	$ 176,059

INDIRECT COSTS:

11.	Employee Fringe Benefits	7,228	
12.	Other Indirect Costs	15,986	
	Total Indirect Cost	23,937	$ 23,937

TOTAL PROJECT COST $ 199,996

BUDGET DETAIL

Direct Costs:

1. Labor Charges

	Direct Labor	Monthly Salary	No.Months	Total Salary
A.	T.A. Cahill	$2,175./wk	1 week	$ 2,175
B.	M. Taylor	1,950./wk	6 weeks	11,700
C.	T.E. Gill	2,185./mo	6 months	6,555
D.	J.S. Reid	2,185./mo	6 months	6,555
E.	M.L. Yau	2,185./mo	6 months	6,555
F.	H. Cho	2,185./mo	6 months	6,555
G.	Research Asst.	2,072./mo	7 months	9,324
H.	Student Assts.	4.75./hr	1500 hours	7,125
			SUBTOTAL	$56,544

2. Subcontractors & Consultants — Estimated Cost

A. Contractor - Fence Construction — $30,000

1. Local Contractor must have California Contractor's License.

   a. Maintain secure area(s) for storage of fences, etc.

   b. Supply vehicle suitable for:

      (1). Work on lake bed
      (2). Capable of carrying fence, tools and personnel.

   c. Supply operator for vehicle:

      (1). Estimated days: 180 days
      (2). Work hours: 1,440 hours

   d. Supply safety equipment, communications equipment, etc.

   e. Superisor of operator - 20% time

      (1). Estimated days: 180 days
      (2). Work hours: 288 hours

B. Administration - State Lands Commission — 6,500

Public Trust at Owens Lake and Dust Nuisance Abatement: $6,500.

SUBTOTAL — $36,500

3. Equipment	Estimated Cost
A. All Terrain Vehicle - 4 wheel	$ 1,800
B. Trailer For ATV	600
C. Electric Winch, etc. - On Lake	400
D. Meterorological Equipment (add-on to equipment on loan to project. See also ARB contract #132-105)	2,400
SUBTOTAL	$ 5,200

4. Travel & Subsistence	Estimated Cost
A. Air Transportation (none)	
B. Ground Transportation	
1. Round trips to Owens Lake 600 miles @ 0.24/mi -$144 x 15 trips	$ 2,160
2. Transportation at Owens Lake UC car rental for 6 months.	2,600
C. Per Diem or Subsistence 160 days @ $26/day	4,160
D. Other - Rental of housing (replaces housing)	5,000
SUBTOTAL	$13,920

5. Electronic Data Processing	Estimated Cost
A. Computer Usage	$ 0
SUBTOTAL	$ 0

6. Reproduction & Publication	Estimated Cost
A. Progress Reports/Final Report	$ 1,500
SUBTOTAL	$ 1,500

7. Mail & Telephone	Estimated Cost
A. Telephone At Lone Pine	$ 800
B. Mail Costs	200
SUBTOTAL	$ 1,000

8.	Materials & Supplies	Estimated Cost
A.	Sand Fencing, Posts, Cable, etc.	$50,000
B.	Film, Optical Support	800
C.	Hardware, etc.	900
D.	Materials For Sand Traps, Vehicle Tow	2,105
E.	Safety Equipment (Helmets, etc.)	200
F.	Miscellaneous Supplies	590
	SUBTOTAL	$54,595

9.	Analyses	Estimated Cost
A.	Compositional Analysis - Aerosols	$ 1,700
B.	Compositional Analysis - Water, etc.	600
	SUBTOTAL	$ 2,300

10.	Miscellaneous	Estimated Cost
A.	Graduate Student Fee Remission	$ 4,500
	SUBTOTAL	$ 4,500
	TOTAL DIRECT COSTS	$176,059

Indirect Costs:

11.	Employee Fringe Benefits	Estimated Cost
A.	Employee Benefits	$ 7,228
	SUBTOTAL	$ 7,228

12. Indirect Costs

(Based on modified total direct costs [MTDC] basis where MTDC = direct cost less equipment.

Rate 0.10 x MTDC 167,087.* = $16,709

*Overhead does not apply to items 3 (Equipment) and 10 (Graduate Student Fee Remission), and partial item 2 (SLC administration).

SUBTOTAL	$16.709
TOTAL INDIRECT COST	$16,709
TOTAL PROJECT COST	$199,996

ATTACHMENT B

AGREEMENT BETWEEN
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
AND STATE OF CALIFORNIA, STATE LANDS COMMISSION
FOR THE PROVISION OF
RESEARCH AND DEVELOPMENT SERVICES

TERM:

FROM: May 1, 1992 TO: April 30, 1995

SCHEDULE OF FEES AND PAYMENT:

Great Basin Unified Air Pollution Control District shall pay the State of California, State Lands Commission the sum of fifty thousand dollars ($50,000) for the final data analysis reports resulting from the work described in Attachment A. Payment shall be made in a lump sum and will be paid within thirty (30) days of receipt of the funds from the City of Los Angeles Department of Water and Power