FRIANT WATER USERS AUTHORITY
SECTION 1600
MEMORANDUM OF UNDERSTANDING

Submitted to:
California Department of Fish and Game
1234 East Shaw Avenue
Fresno, CA 93710

Prepared for:
Friant Water Users Authority
854 North Harvard Avenue
Lindsay, CA 93247-1715

Prepared by:
M.H. WOLFE and Associates
ENVIRONMENTAL CONSULTING INC.
P.O. Box 10254
Bakersfield, CA 93389-0254

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MEMORANDUM OF UNDERSTANDING

Between

FRIANT WATER USERS AUTHORITY

and

CALIFORNIA DEPARTMENT OF FISH AND GAME

regarding

ROUTINE MAINTENANCE ACTIVITIES IN IMPROVED/UNIMPROVED CHANNELS

This Memorandum of Understanding (MOU) by and between the California Department of Fish and Game, hereinafter called the "Department", and the Friant Water Users Authority, hereinafter called the Authority, (both hereinafter referred to as "Parties") is for the purpose of delineating and defining routine maintenance activities in unimproved natural channels, leved or improved natural channels and drain ditches and other drainages associated with the operations and maintenance of the Friant-Kern Canal which shall not require further notice and agreement pursuant to Section 1601 of the Fish and Game Code.

WHEREAS, Section 1601 of the Fish and Game Code allows the Department to propose reasonable modifications to certain Authority construction projects as would allow for the protection and continuance of certain existing fish and wildlife resources that may be substantially adversely affected by that construction project and operation or maintenance of existing facilities; and

WHEREAS, with regard to any project that involves routine maintenance and operation of water supply, drainage, flood control, or waste treatment and disposal facilities, notice to the Department, pursuant to Section 1600 et seq. is not required subsequent to the initial notification and agreement, unless the work as described in the agreement is substantially changed or conditions affecting fish and wildlife resources change, and the resources are adversely affected by the activity conducted under the agreement; and

WHEREAS, it is essential that the Authority perform routine maintenance and operations activities within improved/unimproved channels to maintain the design or discharge capacity of the channel(s), to protect the Authority’s investment, to prevent loss of life and property, to promote efficient and wise use or
disposal of water; to restore and enhance endangered species, their habitat and other wildlife values in accordance with the federal endangered species Biological Opinions; and

WHEREAS, consistent with the policies of California Fish and Game Code Section 1600 et seq., the protection and conservation of the fish and wildlife resources of California are of utmost public interest, and fish and wildlife conservation is a proper responsibility of the State; and

WHEREAS, in order to avoid future conflicts, it is mutually beneficial to delineate and define routine maintenance, to establish procedures to expedite maintenance activities, and to provide for the protection, continuance, enhancement and restoration of the existing fish or wildlife resources during such maintenance activities as required by the Friant contract Biological Opinions; and

WHEREAS, nothing in this agreement shall constitute a waiver of any future or current Department claims to the use and maintenance of natural conditions under the public trust doctrine; and

WHEREAS, nothing in this agreement shall constitute a waiver of the Authority’s claimed rights to maintain and operate the channel(s) solely from the irrigation and or flood control standpoint without a 1601 agreement; and

WHEREAS, this MOU is not intended to affect the Authority’s rights under Fish and Game Section 1601 (f) to undertake emergency work necessary to protect life or property.

NOW THEREFORE, the Department and the Authority agree as follows:

I. DEFINITIONS

The following definitions shall govern this MOU:

**Exhibit 1** - Exhibit 1 (Figure 3) is a map submitted by the Authority which shows properties and/or facilities that will be subject to this MOU. Known problem areas and sites requiring intensive work have been highlighted, and briefly discussed.

**Natural channel** - A natural channel is defined as a stream or river bed which is not confined by man-made levees, berms or banks.
Unimproved channel – An unimproved channel is defined as a channel of a stream or river in which significant man-made alteration and/or improvements have not occurred (concrete lining, etc.).

Improved channel – An improved channel is a natural waterway with existing fish or wildlife resources in which significant man-made alterations have occurred to improve the passage of flows, including straightening and containing the flows within constructed banks and concrete-lined, rip-rapped, or earth trapezoidal channels with engineered banks. The inclusion of certain improved channels in this MOU is not concurrence by the Authority that the Department has jurisdiction on all improved channels.

Leveed channel – A natural channel of a stream of or river which is confined by man-made levees, berms or banks.

Channel banks, channel bottoms, low flow channels and other appurtenant features of unimproved channels are defined by the illustrations shown on Figures 1 and 2.

DBH – The diameter of a tree at breast height (1.4m) is termed DBH.

Drain ditches – A drain ditch is defined as a man-made channel which collects water from cross-land flow where natural channels are not present or have been eliminated by adjacent landowners on the uphill or downhill side of the Friant-Kern Canal or any of its associated structures. This water is then either held in the drain ditch or channeled across the Friant-Kern Canal.

Maintenance activities – Maintenance activities in unimproved channels are defined as: (1) the removal/displacement of sand, silt, sediment, debris, rubbish, woody or aquatic vegetation and other obstructions to flow on the channel floor or banks; and (2) the control of trees, shrubs, weeds, grasses, and emergent vegetation either via mechanical or chemical means; and the cleaning and clearing of erosion control facilities as authorized in this MOU.

Reclamation activities – Reclamation activities are defined as site preparation, including soil preparation, filling of erosion gullies, seeding, mulching and/or transplanting of species (trees, shrubs, grasses or forbs) for the control of erosion, sedimentation, slope stabilization and/or habitat enhancement.

Toe-drain – A toe-drain is a drain ditch which runs parallel to the base of the canal banks.
Figure 1. Unimproved channel definitions (channel bank, bottom, low flow channel, etc.)
Figure 2. Unimproved channel definitions.
**Siphon** - A siphon is an underground pipe which transports the canal water under a channel, or sometimes a road or other structures. In addition to the aforementioned, siphons are also included, channels above siphons must be maintained to prevent bed cutting and damage or disruption to the siphon.

II AUTHORIZED ACTIVITIES

Authorized activities include those described in this part which occur on the Friant-Kern Canal system illustrated on Figure 3. The maintenance activities will occur on the improved channels, unimproved channels, leveed channels, drain ditches, toe-drains, and work areas specified in Appendix 1, and described in Appendix 2. Detailed milepost maps in Appendix 3 show the specific location of each drainage.

The maintenance activities shall be in accordance with the procedures described below, shall not require further notice to, or agreement with the Department.

A. Debris or Obstruction Removal

Debris or obstruction removal may include the removal of fallen trees, substantial amounts of debris, rubbish, and other obstructions from areas (not to exceed the length of legal channel right-of-way) of man-made facilities, and the removal of those materials only in the necessary vicinity (not to exceed the length of legal channel right-of-way) of a bridge, culvert, toe-drain, diversion, or flow control structure when said materials cause obstruction(s) to flow. Human generated debris, such as lawn and farm cuttings, garbage, and trash may be removed from any section.

B. Silt, Sand or Sediment Removal

Removal/displacement of silt, sand, or sediment, debris, rubbish and other obstructions when said materials cause obstruction(s) to flow.

C. Maintenance of Channel Capacity

Maintenance may include removal/displacement of accumulated sand, silt, sediment, debris, rubbish and other obstructions to maintain channel capacity. The bottom half of channel banks are to be cleared in strips in alternating years, if possible, in
order to retain habitat for wildlife, or in accordance with recommendations of a qualified biologist following a field evaluation of habitat conditions. These are indicated in Appendix 1.

D. Vegetation Control

D1) Mechanical control

Mechanical control of aquatic vegetation and woody growth of less than 4 inches DBH, for removal of obstructions to flow in the channel bottom from toe-to-toe, will be conducted as shown on Figure 4. Where appropriate, removal of non-native vegetation (bamboo {arundo}, tamarix {salt cedar}, tree tobacco, castor bean, pampas grass, eucalyptus, acacia, etc.), regardless of DBH, including stump and root removal from top of bank, as shown on Figure 5. Control of aquatic vegetation and woody growth of less than 6 inches DBH which restrict flow, will be accomplished by use of mechanical devices, chemicals, controlled burning, or hand labor in reaches of the channels specified in Figure 4 and listed in Appendices 1 and 2. Flow restricting branches hanging into channels from trees or shrubs rooted in the upper half or tops of banks may be removed. Some drainages may support trees in the channel floor which exceed the above dimensions because the channels have not been cleared in many years. A variance for these locations will be negotiated on a case-by-case basis.

Removal of vegetation from the total bank profile may be allowed if a Department representative agrees to the removal after an on-site inspection, and limits of the removal are specifically defined in writing.

D2) Aquatic vegetation control

To minimize adverse impacts and accelerated sedimentation, chemical control of vegetation in water will be accomplished with the use of an herbicide approved for in-channel or aquatic use, as applicable. Application shall be done in accordance with the label. Heavy thick growth may require removal by mechanical means.

D3) Chemical vegetation control

An herbicide will be used for spot control of bamboo and/or
Figure 4. Control of aquatic and woody growth.
Figure 5. Control of non-native vegetation.
other noxious or exotic vegetation to maintain control following mechanical removal. Such treatment is anticipated on alternate years, or as necessary. Applications shall be made in accordance with the chemical label.

E. Repair of Existing Erosion Control Work

Repairs may include, but not be limited to failed rock, sacked concrete, gabion section, or concrete linings, as appropriate. Maintenance activities shall be confined to the failed section and immediately adjacent areas affected by the failure. Surface water, if any, shall be diverted from the work area when using equipment in the channel. Sediment control measures shall be implemented as appropriate.

F. Minor Erosion Control Work

Sloping, installation of rock, gabions, or other erosion control measures as shown in Figures 6 and 7, may occur from the toe of slope in the channel to a maximum of the 100 year storm event evaluation, measured vertically, above the channel invert to stabilize the eroded areas. Project work shall be limited to periods of low stream flow if possible. Unless agreed otherwise, and should stream flow exist, the stream flow shall be diverted around the work area in a temporary culvert/pipe, by pumping, or by a low flow channel. Project work shall be performed in a manner that minimizes stream turbidity. Removal of vegetation shall be minimized to that necessary to safely accomplish the repair work. Native trees greater than 6 inches DBH outside of the toe-to-toe channel shall remain, unless absolutely necessary to obtain access. To the extent possible, the stream channel shall be returned to its natural state without creating a possible future bank erosion problem.

Upon project completion, the stream channel bottom shall be scarified from the work site to the equipment entrance, where activities have caused compaction of the streambed soil material. Unless agreed otherwise, disturbed areas outside of the channel and access road, and areas left barren of vegetation as a result of the maintenance activities shall be restored to its natural state by seeding, re-planting, or other agreed upon means with native species of trees, shrubs, and grasses, within 30 days or an agreed upon date immediately prior to the next season of precipitation.
Figure 6. Minor erosion control work.
III. TIME AND MANNER OF MAINTENANCE ACTIVITIES

A. Schedules

Maintenance activities shall be performed at a time and a manner so that the proposed maintenance activities minimize adverse impacts and provide for the protection and continuance of the fish and wildlife.

B. Manner

In consideration of minimizing impacts to fish and wildlife resources, including but not limited to reptiles, amphibians, birds, mammals, and fish, maintenance activities will be conducted whenever possible when channels are dry. However, that may not always be possible. In that event, other measures as necessary, will be taken to minimize adverse impacts to wildlife and water quality.

In consideration of threatened and endangered fish and wildlife resources, environmental pre-activity surveys shall be conducted as necessary in advance of construction work in accordance with the Friant Division Long-term Contract Renewal Biological Opinion.

Equipment shall not be parked or staged within the channel. Staging and/or parking shall occur on uplands outside of the primary flood plain whenever possible. The Authority will follow its "Field Construction and Spill Contingency Plan (Appendix 3)."

IV. REPORTING REQUIREMENTS

A. Annual Plan

The Authority shall provide a written report to the Regional Manager, Region 4 of the Department, describing the proposed maintenance activities and time schedule, if requested by the Department. The report shall be submitted annually, or as otherwise agreed by both parties.
B. Annual Report

The Authority shall submit an annual report within 60 days of year-end of the maintenance work conducted, if requested by the Department.

V. FEES

This MOU is not valid until an initial filing fee of $111 is received by the Department. This fee is based on the anticipated costs that will be reasonably incurred by the Department to administer and monitor the routine maintenance described in this MOU. No other fees will be collected throughout the term of this MOU, unless the MOU is amended by agreement of the Parties. Any amendment shall incur a fee of $55.

VI. AMENDMENT AND TERMINATION

This MOU cannot be amended or modified in any way except by a written agreement duly executed by the Department and the Authority. Any proposal for amendment or modifications must be delivered for review and approval by the Regional Manager or the official designee of the Regional Manager. This MOU shall terminate on January 1, 2004. If, during the interim, the Authority gives notice to and obtains the agreement of the Department to maintain additional specific facilities, any such additional facilities may be added to Appendices 1 and 2 by written amendment to this MOU. All provisions of this Agreement shall hereafter apply to such additional facilities.

The maximum term for a MOU is five years. This MOU may be renewed for five year increments upon agreement of the parties. Renewals shall incur a filing fee of $111.

VII. ENTIRE AGREEMENT

This MOU, along with the figures and appendices attached hereto, constitutes the entire Agreement and understanding between the Department and the Authority for routine maintenance activities. This Agreement supersedes all prior and contemporaneous routine activity agreements and/or understandings (if any), whether oral or written.

VIII. OTHER ENVIRONMENTAL LAWS, STATUTES, OR REGULATIONS

This MOU does not constitute any form of authorization, permit,
biological opinion, or compliance with the requirements and provisions of any other statute, regulation, requirement, or ordinance respecting the protection or conservation of fish and wildlife resources. Those statutes include, but are not limited to, the California Environmental Quality Act, the California Endangered Species Act, the Federal Endangered Species Act, or the Federal Clean Water Act. The need for separate compliance with these and other laws is understood by the parties. A Biological Opinion (USFWS, 1991) issued to the U.S. Bureau of Reclamation addresses endangered species on the Friant-Kern Canal and associated service areas.
Appendix 1. A list of natural channels, leved channels and toe-drains affected by this MOU.
Alphabetical List of Named Channels

Natural Channels:

<table>
<thead>
<tr>
<th>Location on Friant-Kern Canal</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaweah River</td>
<td>Tulare</td>
</tr>
<tr>
<td>Kings River</td>
<td>Tulare</td>
</tr>
<tr>
<td>Little Dry Creek</td>
<td>Fresno</td>
</tr>
<tr>
<td>St. John’s River</td>
<td>Tulare</td>
</tr>
<tr>
<td>Tule River</td>
<td>Tulare</td>
</tr>
</tbody>
</table>

Leveed natural channels (named):

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<tr>
<th>Drainage</th>
<th>Location on Friant-Kern Canal</th>
<th>County</th>
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</thead>
<tbody>
<tr>
<td>Cottonwood Creek</td>
<td>66.50</td>
<td>Tulare</td>
</tr>
<tr>
<td>Deer Creek</td>
<td>102.69</td>
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</tr>
<tr>
<td>Dog Creek</td>
<td>14.57</td>
<td>Fresno</td>
</tr>
<tr>
<td>Dog Creek</td>
<td>15.49</td>
<td>Fresno</td>
</tr>
<tr>
<td>Ford Creek (Hills Valley Drain)</td>
<td>40.85</td>
<td>Fresno</td>
</tr>
<tr>
<td>Lewis Creek</td>
<td>85.56</td>
<td>Tulare</td>
</tr>
<tr>
<td>Mud Creek</td>
<td>22.28</td>
<td>Fresno</td>
</tr>
<tr>
<td>Mud Creek</td>
<td>22.96</td>
<td>Fresno</td>
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<td>Navalencia Creek</td>
<td>36.10</td>
<td>Fresno</td>
</tr>
<tr>
<td>Porter Slough</td>
<td>94.85</td>
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<td>Sand Creek</td>
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<td>Surprise Creek</td>
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<td>White River</td>
<td>112.90</td>
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<tr>
<td>Wooten Creek</td>
<td>42.42</td>
<td>Fresno</td>
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<tr>
<td>Yokohl Creek</td>
<td>73.74</td>
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## Sequential Milepost List of Channels, Siphon Crossings, and Toe-drains

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<td></td>
<td>3.49</td>
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<tr>
<td>Ambrosio Tract</td>
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<td></td>
<td>7.40</td>
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<tr>
<td></td>
<td>7.93</td>
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</tr>
<tr>
<td></td>
<td>8.32</td>
<td>Fresno</td>
</tr>
<tr>
<td></td>
<td>9.07</td>
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<td>Kern</td>
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Appendix 2. Individual milepost data inventory sheets, photographs and location and right-of-way maps.
Appendix 2. Individual milepost data inventory sheets, photographs and location and right-of-way maps.
Type of Structure: Siphon _____ Toe-Drain _____ Underdrain _X_ Other____

Width (ft.): 25'  
Type of Maintenance: Chemical application.

Height (ft.): 6'  

Length (ft.): *ISCROW  

Road (L or R): No access  

% Vegetation:  

Habitat Type: Aquatic: weedy marsh  
Upland: non-native grassland.

Trees: Willow (*Salix* sp.)  Shrubs: None  
Herbaceous: X (in canal)

Quadrangle Map Name: Friant  
County: Fresno

NW1/4, Section 17, T. 11S, R. 21E, M.D.B.& M.


*Inside canal right-of-way.

**Two coyotes (juveniles) sighted ~13:05 hrs.

Date: October 2, 1995
Type of Structure: Siphon ____ Toe-Drain ____ Underdrain ____ Other ____

Width (ft.): 61'  
Type of Maintenance: Chemical application and crane with clam shell excavator.

Height (ft.): 18'  

Length (ft.): 73' to fence (*INCROW)  

Road (L or R): No access  

% Vegetation: In drainage  
Habitat Type: Weedy wetland; non-native grassland.

Trees:  
Herbaceous: X (upstream and downstream)

Shrubs:  

Quadrangle Map Name: Friant  
County: Fresno

NE1/4, Section 17, T. 11S, R. 21E, M.D.B.& M.

Notes: Nettle (*Urtica dioica* ssp. *holosericea*); willow herb (*Epilobium ciliatum* var. *ciliatum*); sedge (*Carex* sp.).

*Inside canal right-of-way.

Date: October 2, 1995
PARCEL 1 = 3.0 ACRES
PARCEL 2 = 15.0 ACRES
TOTAL = 18.0 ACRES

SCALE 1" = 400'
Type of Structure: Siphon  ____  Toe Drain  ____  Underdrain  ___  Other ___

Width (ft.):  33'  

Height (ft.):  8'  

Length (ft.):  *INCROW  

Road (L or R):  No access  

% Vegetation:  

Habitat Type:  Weedy wetland; non-native grassland.  

Trees:  

Shrubs:  

Herbaceous:  X  

Quadrangle Map Name:  Friant  

County:  Fresno  

NW1/4, Section 21, T. 11S, R. 21E, M.D.B.& M.  

Notes:  Downstream and upstream: cocklebur (Xanthium strumarium); thistle (Cirsium sp.); rush (Juncus sp.); willow herb (Epilobium ciliatum var. ciliatum); Bermuda grass (Cynodon dactylon); unidentified grass.  

*Inside canal right-of-way.  

Date:  October 2, 1995
Type of Structure: Siphon ____ Toe-Drain ____ Underdrain __X__ Other ____

Width (ft.): 45'  

Type of Maintenance: Chemical application and crane with drag line excavation.

Height (ft.): 16'

Length (ft.): *INCROW

Road (L or R): No access

% Vegetation:  
Habitat Type: Weedy wetland - upstream; non-native grassland.

Trees: X  Shrubs: X  Herbaceous: X

Quadrangle Map Name: Friant  County: Fresno

NW1/4, Section 21, T. 11S, R. 21E, M.D.B & M.

Notes: Downstream: willow (Salix sp.); fig (Ficus carica); cocklebur (Xanthium strumarium); cattail (Typha sp.)-100'; unidentified grass. Upstream: non-native grassland. Good size pond at outlet (20' x 20' x 6' deep).

*Inside canal right-of-way.

Date: October 2, 1995
Type of Structure: Siphon ___ Toe-Drain ___ Underdrain _X_ Other ___

Width (ft.): 30'

Type of Maintenance: No maintenance needed. Some chemical application and drag line with crane excavation.

Height (ft.): 6'

Length (ft.): *INCROW

Road (L or R): No access

% Vegetation: 

Habitat Type: Weedy

Trees: 

Shrubs: 

Herbaceous: _X_

Quadrangle Map Name: Friant

County: Fresno

SW1/4, Section 21, T. 11S, R. 21E, M.D.B. & M.

Notes: Downstream: Bermuda grass (Cynodon dactylon); mare's tail (Conyza canadensis); cocklebur (Xanthium strumarium); curly dock (Rumex crispus).
Upstream: drier, rocky.

*Inside canal right-of-way.

Date: October 2, 1995
Parcel 1 = 80.1 Acres
Parcel 2 = 9.1 Acres
Total = 89.2 Acres
Milepost #  5.50
"Little Dry Creek"

Type of Structure:  Siphon  X  Toe-Drain  Underdrain  Other  

Width (ft.):  306'  

Type of Maintenance:  Chemical application; crane with drag line clam shell and dozer work; excavator.  

Height (ft.):  

Length (L or R):  *INCROW  

Road (L or R):  Crosses stream  

% Vegetation:  

Trees:  X  Shrubs:  X  

Habitat Type:  Stream riparian  

Quadrangle Map Name:  Friant  

Herbaceous:  X  

County:  Fresno  

NE1/4, Section 28, T. 11S, R. 21E, M.D.B. & M.  

Notes:  Upstream and downstream: cattail (Typha sp.); willow (Salix sp.) trees and shrubs; willow herb (Epilobium ciliatum var. ciliatum); nettle (Urtica dioica ssp. holosericea); California sunflower (Helianthus annuus); knotweed (Polygonum sp.); fig (Ficus carica); cocklebur (Xanthium strumarium).  

*Inside canal right-of-way.  

Date:  October 2, 1995
Milepost # 5.50
"Little Dry Creek"
DOTTIE BARNHART, TRACT

T.11S., R.21E. M.D.M.
KEY MAP
SCALE 1" = 2540'

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT-CALIFORNIA
FRIANT DIVISION
FRIANT-KERN CANAL RIGHT OF WAY
DOTTIE BARNHART

DRAWN: J.L.S. SUBMITTED: A. L. M. H.
TRACED: H.L.E. RECOMMENDED
CHECKED: H. L. E. APPROVED.

F65A FRIANT, CALIF. JUNE 30, 1937
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<th>Type of Structure:</th>
<th>Siphon</th>
<th>Toe-Drain</th>
<th>Underdrain</th>
<th>X</th>
<th>Other</th>
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<tbody>
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<tr>
<td>Length (ft.):</td>
<td>*INCROW</td>
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<tr>
<td>Road (L or R):</td>
<td>L &amp; R</td>
<td></td>
<td></td>
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<tr>
<td>% Vegetation:</td>
<td></td>
<td></td>
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<tr>
<td>Trees:</td>
<td>X (upstream)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrubs:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Herbaceous:</td>
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<td></td>
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<td>County:</td>
<td>Fresno</td>
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</tr>
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NW1/4, Section 34, T. 11S, R. 21E, M.D.B. & M.

Notes: Downstream: knotweed (*Polygonum* sp.); willow herb (*Epilobium ciliatum* var. *ciliatum*); cattails (*Typha* sp.). Upstream: willows (*Salix* sp.).

*Inside canal right-of-way.

**Buck in drainage, short-eared owl (*Asio flammeus*)

Date: October 2, 1995
Milepost # 7.40
"Ambrosio Tract"
Milepost # 7.40
"Ambrosio Tract"

Type of Structure: Siphon ___ Toe-Drain ___ Underdrain ___ X Other ___

Width (ft.): 46'  
Height (ft.): 20'  
Length (ft.): 2,693'  
Road (L or R): South-side

% Vegetation:  
Habitat Type: Emergent wetland; non-native grassland.

Trees: X  
Shrubs:  
Herbaceous: X

Quadrangle Map Name: Friant  
County: Fresno

NW1/4, Section 4, T. 12S, R. 21E, M.D.B.& M. (on line between Sections 3 and 4)

Notes: Downstream: cattails (Typha sp.); willow herb (Epilobium ciliatum var. ciliatum); cottonwood (Populus fremontii). Upstream: fairly dry non-native grassland. Road access south side. Culvert: 90 degrees.

*Inside canal right-of-way.

**White-tailed kite (Elanus caerulescens)  
Scrub jay (Aphelocoma coerulescens)

Date: October 2, 1995
Milepost # 7.40
"Ambrosio Tract"

Upstream

Downstream
| Width (ft.) | 371' |
| Height (ft.) | 15' |
| Length (ft.) | *INCROW |

**Type of Structure:** Siphon  Toe-Drain  Underdrain  X Other

**Type of Maintenance:** Chemical application, crane with drag line excavator.

**Road (L or R):**

**% Vegetation:**

**Habitat Type:** Downstream: emergent wetland; upland. Upstream: wetland.

**Trees:** X  **Shrubs:**

**Herbaceous:** X

**Quadrangle Map Name:** Friant  **County:** Fresno

**Notes:** Downstream: cattail (*Typha* sp.); willow herb (*Epilobium ciliatum* var. *ciliatum*); willow (*Salix* sp.); thistle (*Cirsium* sp.); knotweed (*Polygonum* sp.).

Upstream: rush (*Juncus* sp.); cattail (*Typha* sp.); cocklebur (*Xanthium strumarium*); nutsedge (*Cyperus* sp.); Bermuda grass (*Cynodon dactylon*).

*Inside canal right-of-way.*

**Date:** October 2, 1995
Type of structure:  Siphon  ____  Toe-Drain  ____  Underdrain  ____  Other  ____

Width (ft.):  40'

Height (ft.):  25'

Length (ft.):  1,505'

Road (L or R):

% Vegetation:  Habitat Type:  Emergent wetland.  Upstream:  upland;  non-native grassland.

Trees:  Shrubs:  Herbaceous:  X

Quadrangle Map Name:  Friant  County:  Fresno

SE1/4, Section 3, T. 12S, R. 21E, M.D.B.& M.

Notes:  Downstream:  cattail (Typha sp.);  knotweed (Polygonum sp.);  pondweed (?);  willow herb (Epilobium ciliatum var. ciliatum).  Upstream:  non-native grassland;  cocklebur (Xanthium strumarium);  California sunflower (Helianthus annuus);  cattail (Typha sp.);  Bermuda grass (Cynodon dactylon).

Date:  October 2, 1995
Milepost # 8.32

Upstream

Downstream
Type of Structure: Siphon  Toe-Drain  Underdrain  X  Other  

Width (ft.): 25'  
Height (ft.): 15'  
Length (ft.): 608'  
Road (L or R): R  

% Vegetation:  
Trees: X  
Shrubs:  
Herbaceous: X  

Quadrangle Map Name: Friant  
County: Fresno  

Notes: Downstream: cattail (Typha sp.) across channel; willow herb (Epilobium ciliatum var. ciliatum); thistle (Cirsium sp.); extensive cattail wetland downstream; willow (Salix sp.); fig (Ficus carica) in side channel. Upstream: some cattail (Typha sp.); one fig tree (Ficus carica); California sunflower (Helianthus annuus); willow herb (Epilobium ciliatum var. ciliatum).  

* White-crowned sparrow (Zonotrichia atricapilla)  

Date: October 2, 1995
Type of Structure: Siphon  Toe-Drain  Underdrain  Other  X
Wash over chute.

Width (ft.):  61'  
Type of Maintenance: Chemical application.

Height (ft.):  15'  

Length (ft.): *INCROW  

Road (L or R): 

% Vegetation:  

Habitat Type: Downstream: herbaceous (weedy) wetland. Upstream: upland; non-native grassland

Trees:  

Shrubs:  

Herbaceous: X

Quadrangle Map Name: Friant  
County: Fresno

SW1/4, Section 11, T. 12S, R. 21E, M.D.B.& M.

Notes: Downstream: rush (Juncus sp.); cocklebur (Xanthium strumarium); mare's tail (Conyza canadensis); willow herb (Epilobium ciliatum var. ciliatum).
Upstream: non-native grassland with cocklebur (Xanthium strumarium).

*Inside canal right-of-way.

Date: October 2, 1995
Type of Structure:  Siphon  Toe-Drain  Underdrain  X  Other

<table>
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<td>% Vegetation</td>
<td>30% mare’s tail</td>
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<td>Habitat Type</td>
<td>Downstream: emergent (Conyza canadensis) wetland. Upstream: upland; non-native grassland.</td>
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<tr>
<td>Trees</td>
<td>X</td>
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<tr>
<td>Herbaceous</td>
<td>X</td>
</tr>
<tr>
<td>Quadrangle Map Name</td>
<td>Academy</td>
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<tr>
<td>County</td>
<td>Fresno</td>
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</table>

**Notes:** Downstream: cattail (*Typha* sp.); willow herb (*Epilobium ciliatum* var. *ciliatum*); thistle (*Cirsium* sp.).

*2 fig trees (*Ficus carica*).

**Date:** October 2, 1995
Type of Structure: Siphon _____ Toe-Drain _____ Underdrain _____ Other _____ X _____

Width (ft.): 35'

Height (ft.): 15'

Length (ft.): See Milepost 11.10 for total (2,184')

Road (L or R): R

% Vegetation: 25% weeds, 25% bare 50% cattails

Habitat Type: Downstream: emergent wetland. Upstream: non-native grassland.

Trees: 

Shrubs: 

Herbaceous: X

County: Fresno

Quadrangle Map Name: Academy

SW1/4, Section 7, T. 12S, R. 22E, M.D.B.& M.

Notes: Cattail (Typha sp.)

*See 11.8 for diagram.

Date: October 2, 1995
Type of Structure: Siphon  Toe-Drain  Underdrain  X  Other

Width (ft.):  123'

Height (ft.):  33'

Length (ft.):  1,667'

Road (L or R):  L

% Vegetation:  10% (sm.) mare's tail
               10% (lg.) fig trees
               80% bare

Habitat Type: Downstream: emergent wetland. Upstream: non-native grassland.

Notes: Road access mare's tail (*Conyza canadensis*) growing downstream near wing walls. Also some willow (*Salix* sp.) and cottonwood trees (*Populus fremontii*). California sunflower (*Helianthus annuus*); monkey flower (*Mimulus guttatus*); knot weed (*Polygonum* sp.); cattail (*Typha* sp.).

Date: October 2, 1995
Type of Structure:  Siphon    Toe-Drain    Underdrain  X  Other

Width (ft.):  61'

Height (ft.):  20'

Length (ft.):  3,036'

Road (L or R):  R

% Vegetation:  100% cattails

Habitat Type:  Downstream: emergent wetland. Upstream: non-native grassland.

Trees:  

Shrubs:  

Herbaceous:  X

Quadrangle Map Name:  Academy

County:  Fresno

SW1/4, Section 18, T. 12S, R. 22E, M.D.B.& M.

Notes:  Downstream: cattail (Typha sp.) with a little knotweed (Polygonum sp.) and cocklebur (Xanthium strumarium). Upstream: curly dock (Rumex crispus); Bermuda grass (Cynodon dactylon), rush (Juncus sp.) and some cattail (Typha sp.).

Date:  October 2, 1995
PARCEL 1: 3.7 ACRES
PARCEL 2: 32.9 ACRES
PARCEL 3: 33.4 ACRES
PARCEL 4: 5.5 ACRES
TOTAL: 75.5 ACRES

FOR FIELD USE
Type of Structure: Siphon____ Toe-Drain ___ X__ Underdrain ___ X__ Other ___

Width (ft.): 139'

Height (ft.): 16'

Length (ft.): 4,804'

Road (L or R): No road

% Vegetation: 100% cattails

Type of Maintenance: Chemical application; drag line; excavator.

Habitat Type: Downstream: emergent wetland. Upstream: non-native grassland.

Trees: 

Shrubs: 

Herbaceous: X

Quad. Angle Map Name: Academy

County: Fresno

NW1/4, Sections 19 and 20, T. 12S, R. 22E, M.D.B. & M.

Notes: Mostly cattails (*Typha* sp.) with knotweed (*Polygonum* sp.) at outlet. Channel accessible but there is no road.

Date: October 2, 1995
Milepost # 14.57
"Big Dry Creek"
Type of Structure: Siphon  X  Toe-Drain  ___ Underdrain ___ Other ___

Width (ft.): 139'  

Type of Maintenance: Chemical application; drag line; excavator.

Height (ft.): 15'

Length (L or R): *INCROW

Road (L or R):

% Vegetation:  

Habitat Type: Streamside riparian "dry".

Trees:   X  

Shrubs:  X  

Herbaceous:  X

Quadrangle Map Name: Round Mountain  

County: Fresno

SW1/4, Section 20, T. 12S, R. 22E, M.D.B.& M.

Notes:  Lots of cottonwood (Populus fremontii) and willow (Salix sp.) seedlings; cocklebur (Xanthium strumarium); California sunflower (Helianthus annuus); cattail (Typha sp.); Bermuda grass (Cynodon dactylon); some bulrush (Scirpus sp.).

*Inside canal right-of-way.

Date: October 2, 1995
Milepost # 15.49
"Dog Creek"
Milepost # 15.49
"Dog Creek"

<table>
<thead>
<tr>
<th>Width (ft.)</th>
<th>Height (ft.)</th>
</tr>
</thead>
</table>

Type of Structure: Siphon  X  Toe-Drain  ____  Underdrain  ____  Other  ____

Width (ft.): 247'  
Height (ft.): 35'  
Length (ft.): 1,318'  
Road (L or R): L & R  
% Vegetation: 10% weeds  
90% cattails  
Habitat Type: Downstream: emergent wetland. Upstream: non-native grassland.  
Trees:  X  
Shrubs:  
Herbaceous:  X  
Quadrangle Map Name: Round Mountain  
County: Fresno  
NE1/4, Section 29, T. 12S, R. 22E, M.D.B. & M.  
Notes: Bulrush (*Scirpus* sp.); cattail (*Typha* sp.); scattered willows (*Salix* sp.); knotweed (*Polygonum* sp.). Also 5 large willow trees.  
Date: October 2, 1995
Milepost # 15.49
"Dog Creek"

Upstream

Downstream
SCALE 1" = 400'

PARCEL 1 = 24.6 ACRES
PARCEL 2 = 3.0 ACRES
TOTAL = 27.6 ACRES
Milepost # 15.49
"Dog Creek"

KEY MAP

SCALE 1" = 2640'

TRACT REQUIRED

MARY LAMKIN TRACT

T. 125, R. 22 E. M.D.M.

SCALE 1" = 400'

TOTAL 2.7 ACRES

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT-CALIFORNIA
FRIANT DIVISION
FRIANT-KERN CANAL RIGHT OF WAY
MARY LAMKIN

DRAWN: J.L.S. SUBMITTED: TRACED: S.
CHECKED: S.

F715A
Type of Structure: Siphon____ Toe-Drain ____ Underdrain __X__ Other ____

Width (ft.): 154'

Height (ft.): 20'

Length (ft.): 3,469'

Road (L or R): R

% Vegetation: 

Habitat Type: Downstream: weedy wetland. Upstream: non-native grassland.

Trees: 

Shrubs: 

Herbaceous: X

Quadrangle Map Name: Round Mountain County: Fresno

SE1/4, Section 28, T. 12S, R. 22E, M.D.B.& M.

Notes: No cattails. Low growing rushes (Juncus sp.)

Date: October 2, 1995
<table>
<thead>
<tr>
<th>Type of Structure:</th>
<th>Siphon</th>
<th>Toe-Drain</th>
<th>Underdrain</th>
<th>X</th>
<th>Other</th>
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<td>Width (ft.):</td>
<td>61'</td>
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<tr>
<td>Height (ft.):</td>
<td>11'</td>
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<tr>
<td>Length (ft.):</td>
<td>2,959'</td>
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<tr>
<td>% Vegetation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitat Type:</td>
<td>Downstream: wetland non-native grassland.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees:</td>
<td>X</td>
<td>Shrubs:</td>
<td>Herbaceous:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Quadrangle Map Name:</td>
<td>Round Mountain</td>
<td>County: Fresno</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td>One fig tree (<em>Ficus carica</em>); low growing rushes (<em>Juncus</em> sp.); Bermuda grass (<em>Cynodon dactylon</em>) in dry parts of bottom.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Date: October 2, 1995
Milepost # 17.65
"Rock Spring"
Type of Structure: Siphon X Toe-Drain ___ Underdrain ___ Other ___

Width (ft.): 200'  Type of Maintenance: Chemical application; dozer; drag line; handwork. Need to build a road and remove trees.

Height (ft.): 20'

Length (ft.): 3,469'

Road (L or R): L & R

% Vegetation: 50% cattails  Habitat Type: Emergent wetland/ some riparian. Upstream: non-native grassland.
50% trees

Trees: X  Shrubs: X  Herbaceous: X

Quadrangle Map Name: Round Mountain  County: Fresno

NE1/4, Section 34, T. 12S, R. 22E, M.D.B.& M.

Notes: Standing water on downstream side. Cattail (Typha sp.)~100' downstream; nice little riparian corridor starts ~250' downstream. Upstream: cattail (Typha sp.); willow (Salix sp.); cottonwood (Populus fremontii); Bermuda grass (Cynodon dactylon); fig (Ficus carica); and curly dock (Rumex crispus).

*~ 10 large willow and fig trees.
*Great egret (Casmerodius albus)

Date: October 4, 1995
Milepost # 17.65
"Rock Spring"

Upstream

Downstream
PARCEL 1 = 11.8 ACRES
PARCEL 2 = 3.3 ACRES
TOTAL 15.1 ACRES
Type of Structure: Siphon X Toe-Drain ____ Underdrain ____ Other ____

Width (ft.): 64'

Height (ft.): 40'

Length (ft.): 4,081'

Road (L or R): L

% Vegetation: 90% cattails
10% large fig

Habitat Type: Downstream: emergent treeswetland. Upstream: non-native grassland.

Trees: X

Shrubs: X

Herbaceous: X

Quadrangle Map Name: Round Mountain

County: Fresno

SW1/4, Section 35, T. 12S, R. 22E, M.D.B.& M.

Notes: Downstream: cattail (Typha sp.); fig (Ficus carica).

Date: October 4, 1995
Milepost # 18.47

Upstream

Downstream
<table>
<thead>
<tr>
<th>Type of Structure:</th>
<th>Siphon</th>
<th>Toe-Drain</th>
<th>X</th>
<th>Underdrain</th>
<th>X</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width (ft.):</td>
<td>46'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (ft.):</td>
<td>40'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length (ft.):</td>
<td>5,918'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road (L or R):</td>
<td>Accessible on L (no road)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Vegetation:</td>
<td>50% cattails</td>
<td>50% (lg.) willow trees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees:</td>
<td>X</td>
<td>Shrubs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadrangle Map Name:</td>
<td>Round Mountain</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td>Cattail (<em>Typha</em> sp.); thistle (<em>Cirsium</em> sp.); willow (<em>Salix</em> sp.); prickly lettuce (<em>Lactuca serriola</em>).</td>
<td></td>
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</tr>
<tr>
<td><em>Pool = 25' x 15' x ~6' deep.</em></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Date:</td>
<td>October 4, 1995</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Milepost # 18.91

Upstream

Downstream
Milepost # 19.91
"Fancher Creek"
Type of Structure: Siphon _____ Toe-Drain _____ Underdrain _____ Other ____ X ____

Overchute

Width (ft.): 46'

Type of Maintenance: No maintenance.

Height (ft.):

Length (L or R): 612'

Road (L or R):

% Vegetation:


Trees: X

Shrubs: X

Herbaceous: X

SW1/4, Section 1, T. 13S, R. 22E, M.D.B.& M.

Quadrangle Map Name: Round Mountain County: Fresno

Notes: Cattail (Typha sp.); willow (Salix sp.); rush (Juncus sp.) - Fancher Creek overshoot.

*Pool 150' x 80' x ? deep (downstream).

Date: October 4, 1995
Milepost # 19.91
"Fancher Creek"

No Channel Upstream

Downstream
Milepost # 22.96
"Mud Creek"
--- Width (ft.) ---

Type of Structure: Siphon ___ Toe-Drain ___ Underdrain ___ X ___ Other ___

Width (ft.): 61'
Type of Maintenance: Chemical application; drag line; excavator.

Height (ft.): 20'

Length (ft.): *INCROW

Road (L or R): Accessible on R (no road)

% Vegetation:

Habitat Type: Emergent wetland.

Trees: X
Shrubs:
Herbaceous: X

Quadrangle Map Name: Piedra
County: Fresno

SW1/4, Section 11, T. 13S, R. 23E, M.D.B. & M.

Notes: Downstream: cattails (Typha sp.); cocklebur (Xanthium strumarium); yellow star thistle (Centaurea solstitialis); bulrush (Scirpus sp.) - starts 200' down. Upstream: Bermuda grass (Cynodon dactylon); some cattail (Typha sp.); rush (Juncus sp.); cocklebur (Xanthium strumarium); cottonwood (Populus fremontii); fig (Ficus carica).

*Inside canal right-of-way.

**Pool = 20' x 30' x 5' deep.

Date: October 4, 1995
Milepost # 28.31 to 28.53
"Kings River"
Type of Structure: Siphon ___ Toe-Drain ___ X Underdrain ___ Other ___

Width (ft.): 25'

Height (ft.): 20'

Length (L or R): *INCROW

Road (L or R):

% Vegetation: Habitat Type: Riparian

Trees: 50% Shrubs: 30% Herbaceous: 20%

Quadrangle Map Name: Piedra County: Fresno

SW1/4, Section 26, T. 13S, R. 23E, M.D.B. & M.

Notes: Cottonwoods (many mature); willows (Salix sp.); valley oaks (Quercus lobata); blackberry (Rubus ursinus); rushes (Juncus sp.) and cattails (Typha sp.)

*Inside canal right-of-way.

Date: August 1995
Milepost # 28.31 to 28.53
"Kings River"

Upstream

Downstream
Milepost # 30.34
"White Tank Spring"
Type of Structure: Siphon  Toe-Drain  Underdrain  Other  X

Width (ft.): 231'

Height (ft.): 20'

Length (ft.): *INCROW

Road (L or R): L

% Vegetation: 75% trees
              25% cattails


Trees: X  Shrubs:  Herbaceous: X

Quadrangle Map Name: Wahtoke  County: Fresno

NE1/4, Section 2, T. 14S, R. 23E, M.D.B. & M.

Notes: Overcrossing. Very large willow (*Salix* sp.); cattails (*Typha* sp.) and fig (*Ficus carica*) trees.

*Inside canal right-of-way.

Date: August 1995
Milepost # 30.34
"White Tank Spring"

KEY MAP
SCALE 1" = 2640'

PARCEL 1 = 8.0 ACRES
2 = 21.8
TOTAL = 29.8
FOR FIELD USE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT - CALIFORNIA
FRIGANT DIVISION
FRIGANT-KERN CANAL RIGHT OF WAY
CHESTER C. MCMURRAY

DRAWN: US SUBMITTED
TRADED: RECOMMENDED
CHECKED
FT75A
Type of Structure: Siphon ___ X ___ Toe-Drain ___ Underdrain ___ Other ___

Width (ft.): 25' Type of Maintenance: No maintenance.
Height (ft.): 1'
Length (ft.): *INCROW
Road (L or R): L & R
% Vegetation: 75% weeds Habitat Type: Upstream and downstream: poor riparian. Upland: non-native grassland

Trees: ___ Shrubs: X ___ Herbaceous: X ___
Quadrangle Map Name: Wahtoke County: Fresno

SE1/4, Section 13, T. 14S, R. 23E, M.D.B. & M.

Notes: Two willow (*Salix* sp.) shrubs downstream. One salt cedar (*Tamarix ramosissima*) shrub upstream.

*Inside canal right-of-way.

Date: August 1995
PORTION OF WAHTOKE THERMAL TRACT

T. 14 S., R. 23 E. M.D.M.

KEY MAP
SCALE 1" = 2640'

AREA = 1.3 ACRES
SCALE 1" = 100'

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT—CALIFORNIA
FRIANT DIVISION
FRIANT-KERN CANAL RIGHT OF WAY
ATCHISON TOPEKA AND SANTA FE RAILROAD CO.

Milepost # 35.16 to 35.58
Type of Structure: Siphon _____ Toe-Drain ___ X Underdrain ____ Other ____

Width (ft.): 20'  
Type of Maintenance: Chemical application; crane drag line excavation and backhoe.

Height (ft.): 15'  

Length (L or R): *INCROW ~ 500' (about to Wahtoke Creek)

Road (L or R):  

% Vegetation:  
Habitat Type: Ruderal

Trees:  
Shrubs:  
Herbaceous: 100%

Quadrangle Map Name: Wahtoke  
County: Fresno

SW1/4, Section 17, T. 14S, R. 24E, M.D.B.& M.

Notes: California sunflower (*Helianthus annuus*); grasses; telegraph weed (*Heterotheca*); cattails (*Typha* sp.).

*Inside canal right-of-way.

Date: August 1995
Milepost # 35.16 to 35.58

Upstream

No Channel Downstream
STATE HIGHWAY No. 180

Portion of Wahtoke Colony

A.T. & S.F.R.R.

GRACE BONTER TRACT

Lot 48

TRACT REQUIRED

T. 14 S., R. 24 E. M.D.M.

KEY MAP

SCALE 1"=2640'

AREA = 10.1 ACRES

SCALE 1" = 400'

GRACE BONTER

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION CENTRAL VALLEY PROJECT—CALIFORNIA FRIANT DIVISION FRIANT-KERN CANAL RIGHT OF WAY

DRAWN: E.S.
SUBMITTED: T.S.
TRADED:
CHECKED:
F782A
AREA = 14.5 ACRES
SCALE, 1" = 400'

FOR FIELD USE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL VALLEY PROJECT - CALIF.
FRIANT DIVISION
FRIANT-KERN CANAL RIGHT OF WAY
FRED C. WRIGHT

DRAWN: G.J.F. SUBMITTED: G.J.F.
TRACED: G.J.F. RECOMMENDED: G.J.F.
CHECKED: G.J.F. APPROVED: G.J.F.

F783A

Property line on channel goes to pipeline line.