EXHIBIT 3 -

COLORADO RIVER CROSSING OIL SPILL CONTINGENCY PLAN

PREPARED BY: TECHSTAFF, INC.
HOUSTON, TEXAS

NOVEMBER 1986

ALL AMERICAN PIPELINE COMPANY

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1.0 INTRODUCTION

This document has been prepared to satisfy numerous needs. Because of this, the document contains more information than most individuals require. It is your responsibility to be familiar with which portions of the Oil Spill Contingency Plan for which you are responsible. If you have any questions, ask your supervisor.

1.1 SPILL PLAN COMPONENTS

The Oil Spill Contingency Plan contains 10 chapters. Chapter 1.0 details the components of the spill plan and how to use them and provides a quick reference for spill response procedures, including phone numbers and addresses for emergency response agencies. Chapter 2.0 discusses the background information pertaining to this plan, such as company policy, scope of the spill plan area, preventive measures, and updating of the plan. Chapter 3.0 provides detailed information concerning oil spill response by the Operator and Federal and State agencies. Chapter 4.0 describes various oil spill containment procedures which may be used for aquatic spills. Chapter 5.0 describes various oil spill clean-up procedures which may be used for aquatic spills. Chapter 6.0 is a brief statement of the objectives of reparation and how to achieve them. Chapter 7.0 describes, in detail, the procedure for documenting the events of, and responses to, a spill. Chapter 8.0 gives important guidelines for dealing with the public relations aspect of a spill. Chapter 9.0 describes the training program which will be used by the Operator. Chapter 10.0 is a listing of reference material used to prepare the spill plan.

1.2 USE OF THE SPILL CONTINGENCY PLAN

The Oil Spill Contingency Plan was prepared for in-house use by field personnel, District Managers, Corporate headquarters, and legal staff. Field personnel should be familiar with the general content of the plan and the information given in Chapter 1.0. Chapters 1.0 through 9.0 need to be carefully studied by the District Managers. The area specific information located in Chapter 1.0 should be posted in a conspicuous place in the District Office. The personnel at the corporate headquarters in Bakersfield, California, need to be thoroughly familiar with their assigned responsibilities as detailed in the Plan.

1.3 PERSONNEL RESPONSIBILITIES

Field personnel responsibilities include the following:

1) Report any spills immediately to the District Office, preferably the District Manager;
2) Insure the safety and well-being of any persons in the immediate vicinity;
3) Do what can be done in a safe manner to contain the spillage; and,
4) Await further instructions from the District Office.

The critical items to be performed are to notify the District Office and to insure the safety of any person, including yourself, in the immediate vicinity of the spill.

Operators who locate a spill through the SCADA system are to contact the appropriate District Office immediately. It is the District Office's responsibility to contact the appropriate Federal and State agencies. After contact has been made with the District Office, the Corporate Headquarters are to be notified. The phone numbers for the two District's are shown in Tables 1-1 and 1-2. The emergency contacts for a spill response are shown, in the sequence to be called, in Table 1-3. Only the numbers in the priority list and the BLM California Desert District require immediate notification.

TABLE 1-1.
NOTIFICATION NUMBERS FOR
COMPANY AND CONTRACTOR PERSONNEL -
BAKERSFIELD DISTRICT

POSITION	NAME	PHONE NUMBER
District Manager	Charles Green	O: 805/398-5651 H: 805/834-3632
Assistant District Manager	Dan Hoffman	O: H: 805/922-1337
Home Office		O: 512/328-2275
Designated Spill Officer	Charles Green	O: 805/398-5651 H: 805/834-3632
ARB, INC.		O: 805/831-7575
Mailing Address:	P. O. Box 1559 Bakersfield, CA 93302	
Location Address:	1500 South Union Avenue Bakersfield, CA 93307	
ENVIRON SERVICES, INC.		O: 602/991-5287
Mailing Address:	7119 E. Shey Blvd. Suite 106-296 Scottsdale, AZ 85254	
Location Address:	7835 E. Redfield Suite 200 Scottsdale, AZ 85260	
HOOD CORPORATION		O: 213/945-1411
Mailing Address:	P. O. Box 4368 Whittier, CA 90607	
Location Address:	8201 South Sorensen Whittier, CA 90606	

TABLE 1-2.
NOTIFICATION NUMBERS FOR
COMPANY AND CONTRACTOR PERSONNEL -
MESA DISTRICT

POSITION	NAME	PHONE NUMBER
District Manager	David Partin	O: 602/844-8396 H: 602/969-6174
Assistant District Manager	Kevin Strege	O: 602/844-8396 H: 602/962-0488
Home Office		O: 512/328-2275
Designated Spill Officer	David Partin	O: 602/844-8396 H: 602/969-6174
ENVIRON SERVICES INC. Mailing Address:	7119 E. Shea Blvd. Suite 106 Scottsdale, AZ 85254 Attn: Paul Williams	O: 602/991-5287
DREW TRENCHING AND BARRIER Mailing Address:	P. O. Box 396 Buckeye, AZ 85326 Attn: Frank Drew	O: 602/386-3756
PINAL DITCHING CO. INC. Mailing Address:	P. O. Box 68 Casa Grande, AZ 85222 Attn: Harold Bell	O: 602/836-7841

TABLE 1-3.
EMERGENCY CONTACTS FOR
A SPILL EVENT -
COLORADO RIVER

PRIORTY CALLS (In Sequence)

Riverside Sheriff's Office
Riverside County Sheriff's Office — 619/922-6121
260 N. Spring St.
Blythe, CA 92225

Bureau Of Reclamation
V. Benjamin Wilkinson — 702/293-8302
Lower Colorado Dams Project Office
P. O. Box 299
Boulder City, NV 89005

OR

Fred Hoggatt — 602/453-5859
Dam Tender - Chief of Parker Field Div.
57 Phoenix St.
Parker Dam, CA

Dam Call Letters

Parker	KOJ-811
Davis	KOJ-814
Hoover	KOJ-804

California Fish and Game/Blythe Office
Richard (Rich) Colby — 619/922-5305 (Office)
Area Spill Coordinator — 619/922-4994 (Home)

Ron Powell — 619/922-5613 (Office)
619/922-6342 (Home)

Arizona Department of Game and Fish
Radio Dispatcher

In-State 24-hr Number: 800/352-0700
Out-of-State 24-hr Number: 602/255-5507

U.S. Fish and Wildlife Service
Wes Martin
Cibola Refuge Manager — 602/857-3253 (Office)
619/922-5374 (Home)

Back-up Contact:
Will Nidecker — 602/783-3371 (Office)
Imperial National Wildlife Refuge — 602/343-1468

TABLE 1-3, Cont.

National Response Center	800/424-8802
California Office of Emergency Services	800/852-7550
Arizona Department of Public Safety Watch Comander	505/827-2918 (Day) 505/262-8209 (Night)

ADDITIONAL NUMBERS

FEDERAL

Bureau of Land Management State Office - Lois Payne Room E-2841 2800 Cottage Way Sacramento, CA 95825	916/978-4725
California Desert District - Dennis McClane 1695 Spruce Street Riverside, CA 92507	714/351-6419 714/351-5651 (24-hr.)

STATE - CALIFORNIA

California Department of Fish and Game Lt. Reid Smith Region V Oil Spill Coordinator	
Work Number: 805/985-1797	

STATE - ARIZONA

Department of Game and Fish - Yuma, Arizona Don Wingfield Regional Supervisor	602/344-3436 (Office) 602/726-5534 (Home)
Alternate Bill Werner	602/344-3436 (Office) 602/344-2814 (Home)

LOCAL EMERGENCY NUMBERS

Police	619/922-6111
Fire Department	619/922-6111
California Highway Patrol	619/922-6141

TABLE 1-3, Cont.

DISPOSAL SITES

Casmalia Disposal Company 539 San Ysidro Road Santa Barbara, CA 93108 ATTN: James McBride	805/969-5897
Environmental Protection Corporation - Eastside 3040 19th Street, Suite 10 Bakersfield, CA 93301 ATTN: Bill Park	805/327-9681
Environmental Protection Corporation - Westside 3040 19th Street, Suite 10 Bakersfield, CA 93001 ATTN: Bill Park	805/327-9681

2.0 BACKGROUND DATA

2.1 PURPOSE

The Colorado River Crossing contingency plan has been prepared to provide All American Pipeline Company (hereafter referred to as the Operator) and contract personnel guidelines and procedures for rapid and efficient response, containment and clean-up of an oil spill. It describes, in detail, response, documentation, public relations, and training procedures. It serves as a guideline for containment and clean-up procedures.

The major thrust of the Operator's spill contingency plan is prevention and up-to-date system safety measures. It has been stated by various authors that pipelines, as a transport class, have a much lower spill rate and potential than other classes such as tankers, rail, or trucking so that use of a pipeline system is in itself a method of spill prevention. Various construction methods to insure system integrity include radiographic inspection, hydrostatic testing at 1.25 times the operating pressure, and cathodic protection. Various system safety measures which will be used include strategically placed automated block and check valves and use of a state-of-the-arts computer-controlled supervisory control and data acquisition (SCADA) system.

Several site specific construction techniques for insuring system integrity were used in addition to the above mentioned typical construction methods. First, the crossing was constructed using directional drilling as opposed to normal trench excavation. Second, the pipe was placed a minimum of 4' below the identified 100-year scour zone. Third, extra thick pipe (wall thickness - .500 or 1/2") was used for the crossing. Fourth, the pipe used for the crossing was welded and tested to 300% operating pressure prior to its installment. And finally, the pipe in the crossing was tested in placed after installation to 180% operating pressure.

Each recipient of this plan should read it thoroughly and know the response procedures indentified. Personnel with job assignments described in this plan should pay close attention to their roles and resources during a spill event. Every employee is expected to accept the policies and procedures identified in the plan and to conduct all activities in a manner which maximizes spill prevention.

2.2 COMPANY POLICY

It is the Operator's policy that the major intent is to prevent a spill. However, if a spill occurs, employees and contractors will respond in an efficient and professionally responsible fashion. The Operator is committed to the protection of the environment and concerns of those involved with the operation of our pipeline.

2.3 LOCATION

The All American Pipeline (AAPL) Company crossing of the Colorado River is located in Section 16, Township 3N, Range 22W,G.S.R.B.M. at M.P. 303 in the Mesa, Arizona Operations District. The approximate River Mile is R.M. 120.5. The general location of the crossing is depicted in Figure 2-1. The AAPL alignment sheet for the crossing is provided in Figure 2-2. The U.S. Department of Interior, Bureau of Reclamation facility map 9 (of 20), which shows the AAPL crossing, is shown in Figure 2-3.

2.4 PREVENTIVE MEASURES

The SCADA (Supervisory Control and Data Acquisition) system for this pipeline provides for detailed alarm, status, and control functions. The supervisory control system will be operated from a master station located at Austin, Texas. The master station will originate remote control commands and receive status and alarm data from the remote terminal units (RTU). The RTU's will receive and execute valid commands from the master station and transmit alarm and status information to the master station. Standby power will be provided for the SCADA and RTUs to insure operation when commercial power fails. A communication system will transmit the data to and from the master station. The detailed data will be provided to the master station in both visual and hardcopy format. Redundant computers and peripheral equipment, provided at the master station to increase reliability and allow for maintenance and repair without disrupting normal pipeline supervision and control, will be programmed to continuously scan for alarms.

The leak detection method for this system employs operational pipeline measurement devices integrated into the SCADA system. This leak detection concept has traditionally been referred to as the volume balance method. Using data accumulated and transmitted by the SCADA system, the differences between the fluid inflow and outflow are calculated.

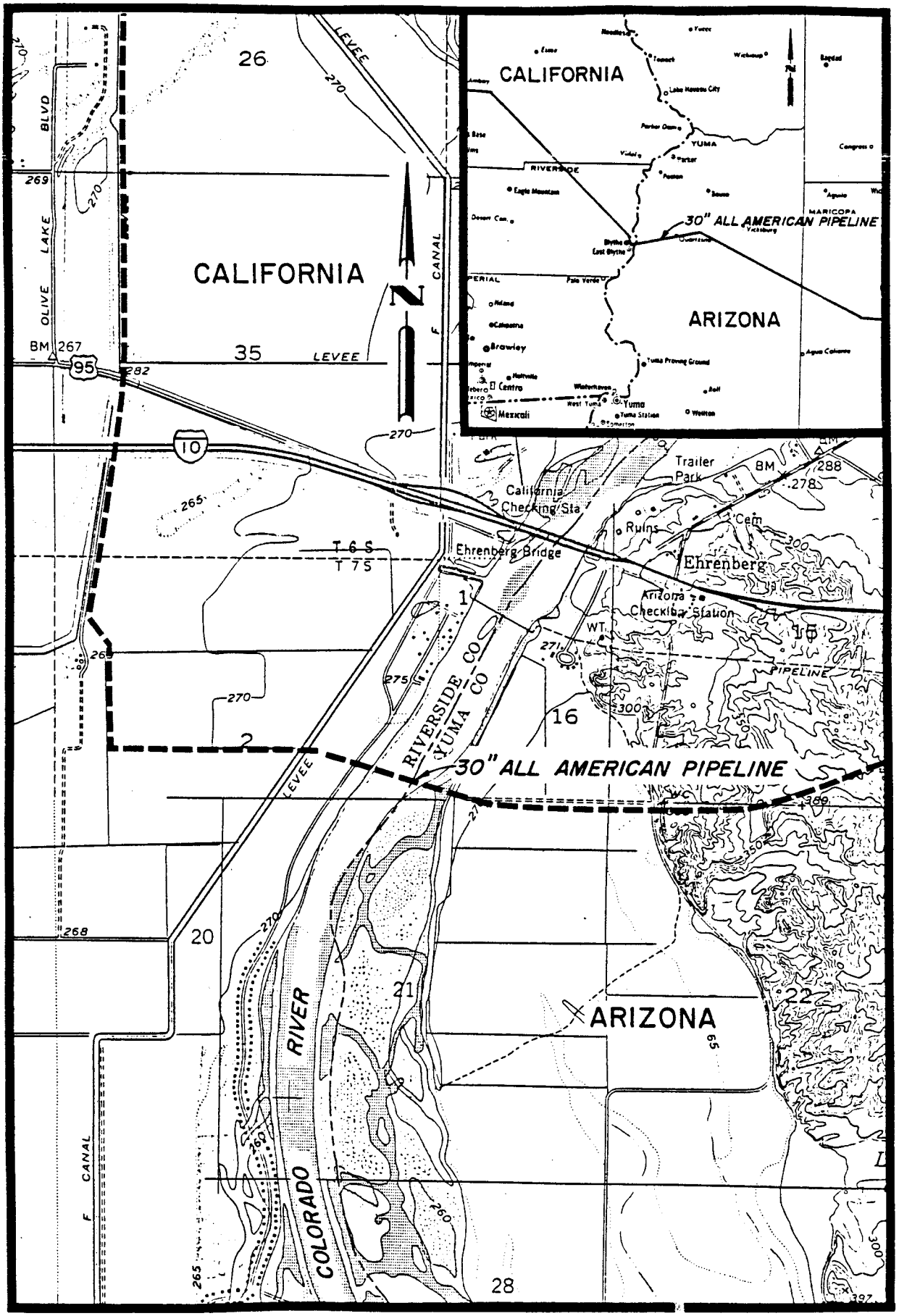
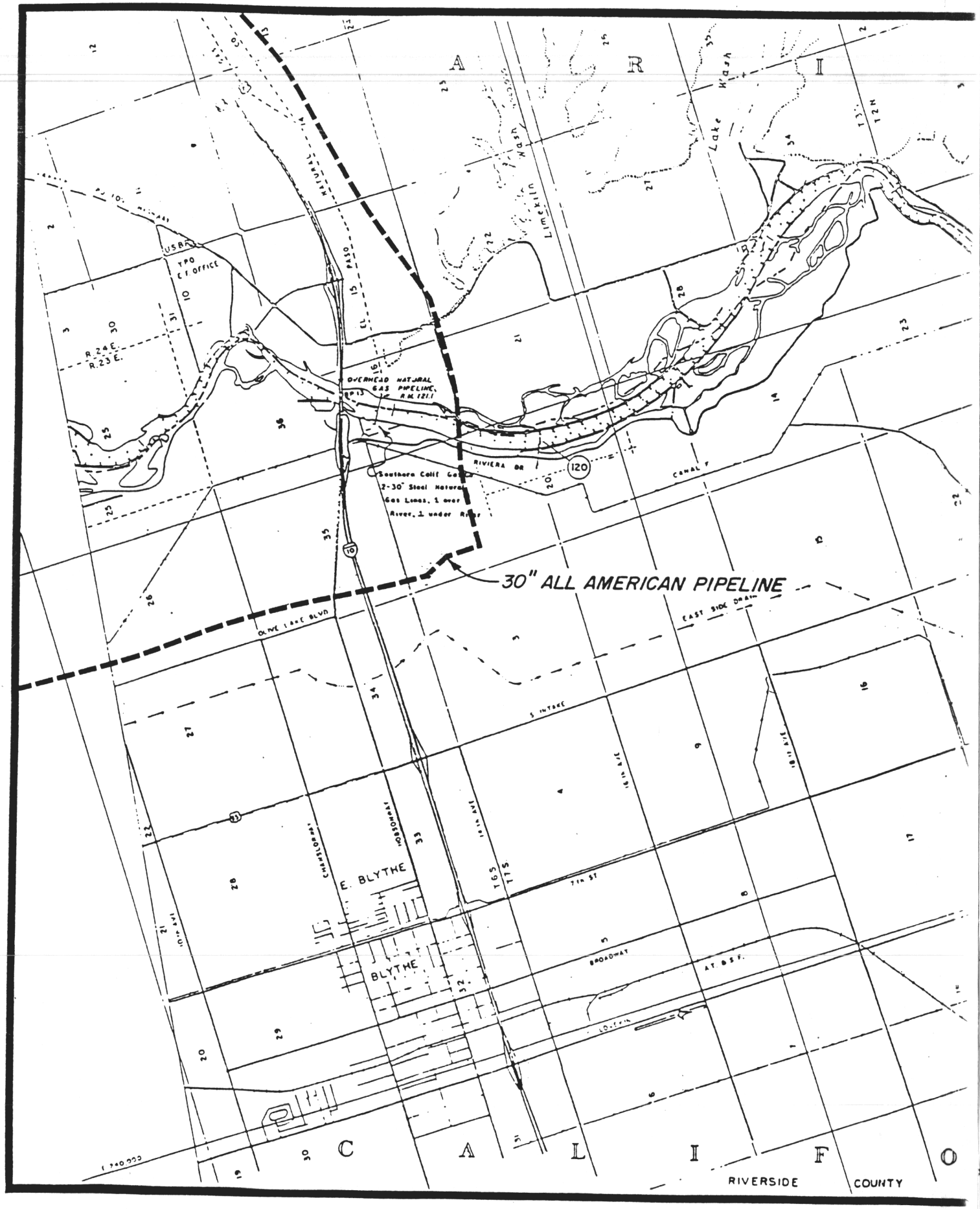


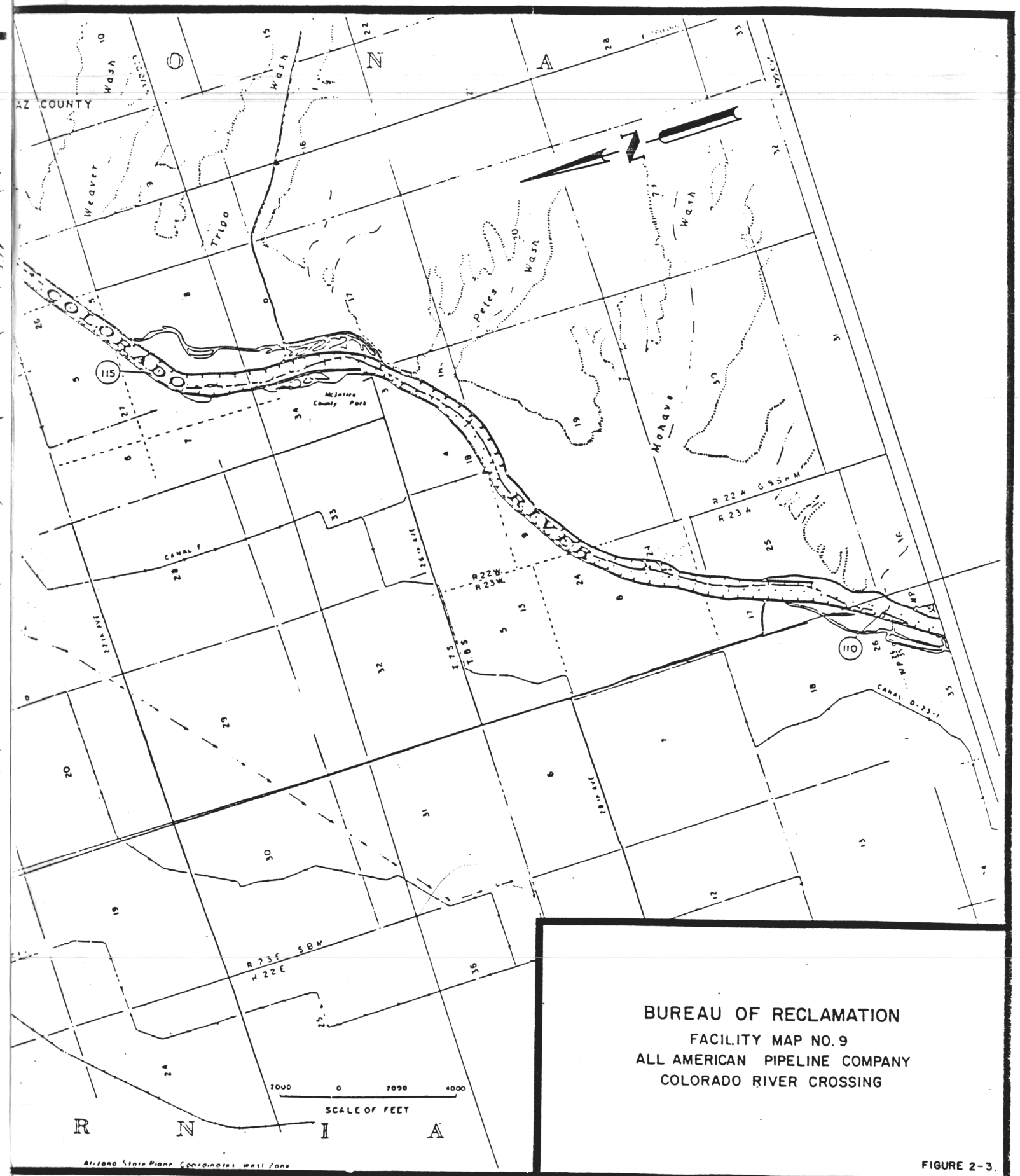
FIGURE 2-1. Location map of the Colorado River Crossing.

FIGURE 2-2.

ALIGNMENT SHEET DEPICTING THE ALL AMERICAN PIPELINE COLORADO RIVER CROSSING.

Please see pocket at end of report.





BUREAU OF RECLAMATION

FACILITY MAP NO. 9
ALL AMERICAN PIPELINE COMPANY
COLORADO RIVER CROSSING

FIGURE 2-3.

Based on actual pipeline system tests and analyses, volume balance thresholds are established. These thresholds are then programmed into the SCADA system and appear as alarms to the master station if the thresholds are exceeded. This leak detection concept is based on the assumption that the fluid volumes lost to leakage will result in a discrepancy between metered inlet/outlet volumes and calculated changes in the pipeline fluid inventory.

Block valves will be installed in the pipeline to allow selective isolation of various segments of the line for maintenance, modification and emergency shutdown. The design placement of the valves in a particular pipeline system is primarily based on environmental and safety requirements developed by the American Petroleum Institute and Department of Transportation. Block valve status monitoring and control is performed by the operator at the master station using the SCADA system.

The Operator will utilize a cathodic protection system consisting of distributed impressed current sources (both rectifiers and bonds to existing systems) and supplemental galvanic anodes to protect the pipeline from the detrimental effects of external corrosion. In addition to the cathodic protection system, a high quality external coating was applied to the pipeline. The coating will effectively lower the total amount of pipe exposed to the soil (electrolyte) thereby lowering the protection current required to achieve an adequate level of protection. The corrosion control system was designed in compliance with the Department of Transportation, Code of Federal Regulations, Title 49; Subpart D (liquids); Parts 195.236-195.244, 195.414 and 195.416 and all applicable State Regulations.

Cathodic protection test stations utilize approximately one mile spacing intervals. Additional test stations are installed at closer intervals (roads, railroads, valves, rectifiers and foreign crossings) as deemed appropriate, based on actual field conditions. Four different types of test stations are being installed based on site specific requirements:

Type A - Single Wire (Standard)

Type B - Two Wire (Current Flow)

Type C - Three Wire (Casing)

Type F - Four Wire (Foreign Crossing)

Locations of the test stations are indicated on the as-built alignment sheets.

Impressed current cathodic protection rectifiers and/or groundbeds are installed at approximately eighty (80) mile intervals. Rectifiers (Figure 2-4) are installed at the Operator's Pump Stations where and if possible. Groundbeds are of the Deep Well variety (Figures 2-5 and 2-6) and are approximately three hundred (300) feet in depth and eight (8) inches in diameter. Each groundbed contains approximately twenty (20) impressed current anodes surrounded by a column of coke breeze backfill. They are designed for an output of thirty (30) amps. Individual anode lead wires are run above ground to a junction box for measurement purposes. The cathodic protection system is inspected annually as required by DOT regulations. High priority areas are monitored monthly, as are the rectifiers and current bonds. No groundbeds are installed at or in the immediate vicinity of the AAPL Colorado River crossing.

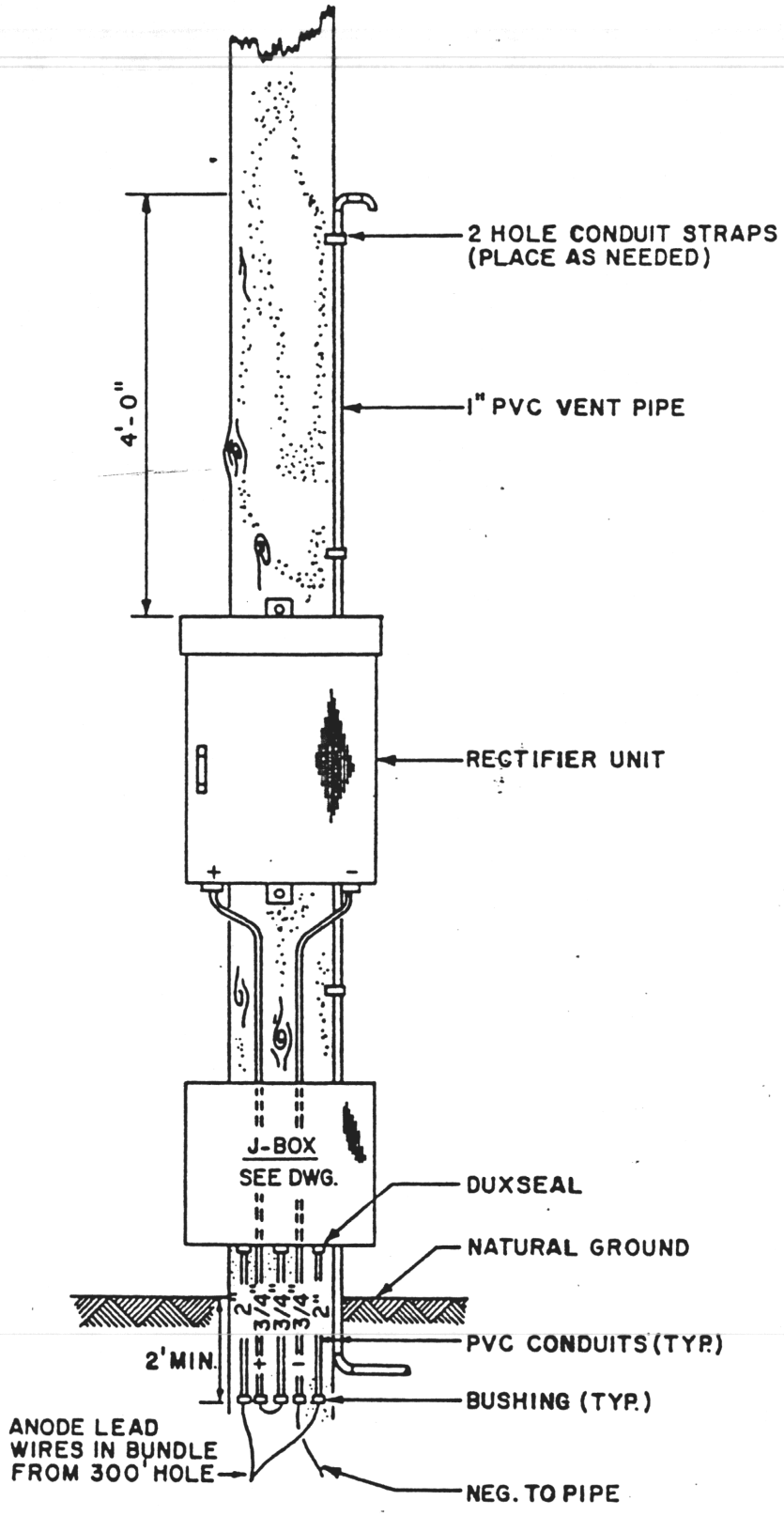
All major pump station equipment is monitored by onsite sensors. If a mechanical or electrical fault occurs, the defective equipment is automatically stopped and an alarm sent to the dispatcher. The dispatcher cannot restart the defective equipment until repairs are made and a lockout mechanism is locally reset.

Permanent markers are erected the length of the line. These include mile markers for aerial reconnaissance, road and stream crossing markers, and other markers indicating the presence of the pipeline.

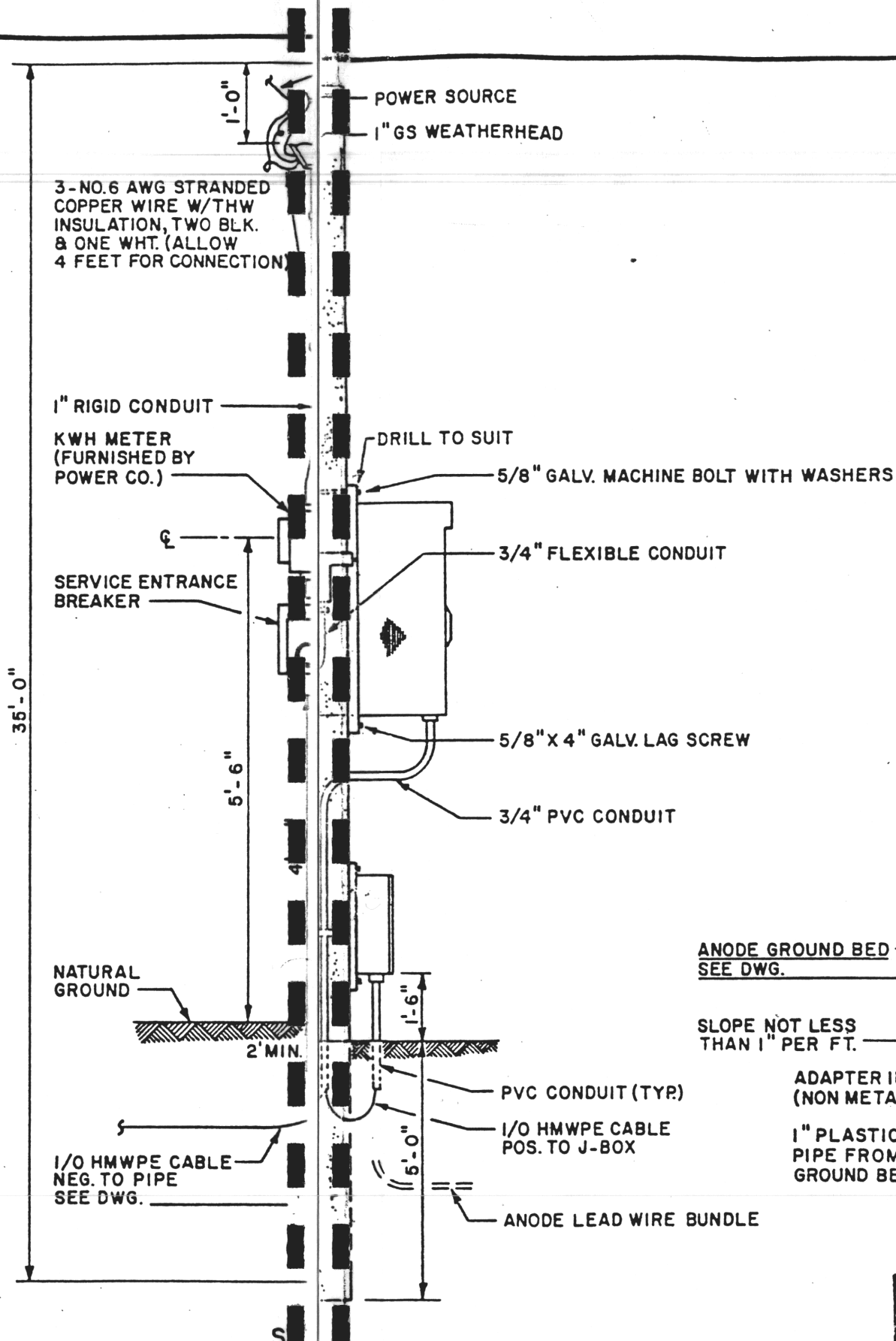
Routine maintenance and checks help to insure that the integrity of the pipeline and its components remain intact. Frequent fly-overs (minimum once a week) are conducted to provide aerial reconnaissance in addition to routine walk-overs by maintenance personnel. All components are routinely checked and serviced to maximize longevity and minimize wear.

2.5 UPDATING

Periodically (no less than 15 months), the spill contingency plan will be reviewed for updates. When this occurs, a notice will be distributed to all parties on the plan distribution list. Accompanying the notice will be a solicitation for comments/recommended changes for updating the plan. All changes will be submitted to and approved by the Authorized Officer or his designated representative.



FRONT ELEVATION



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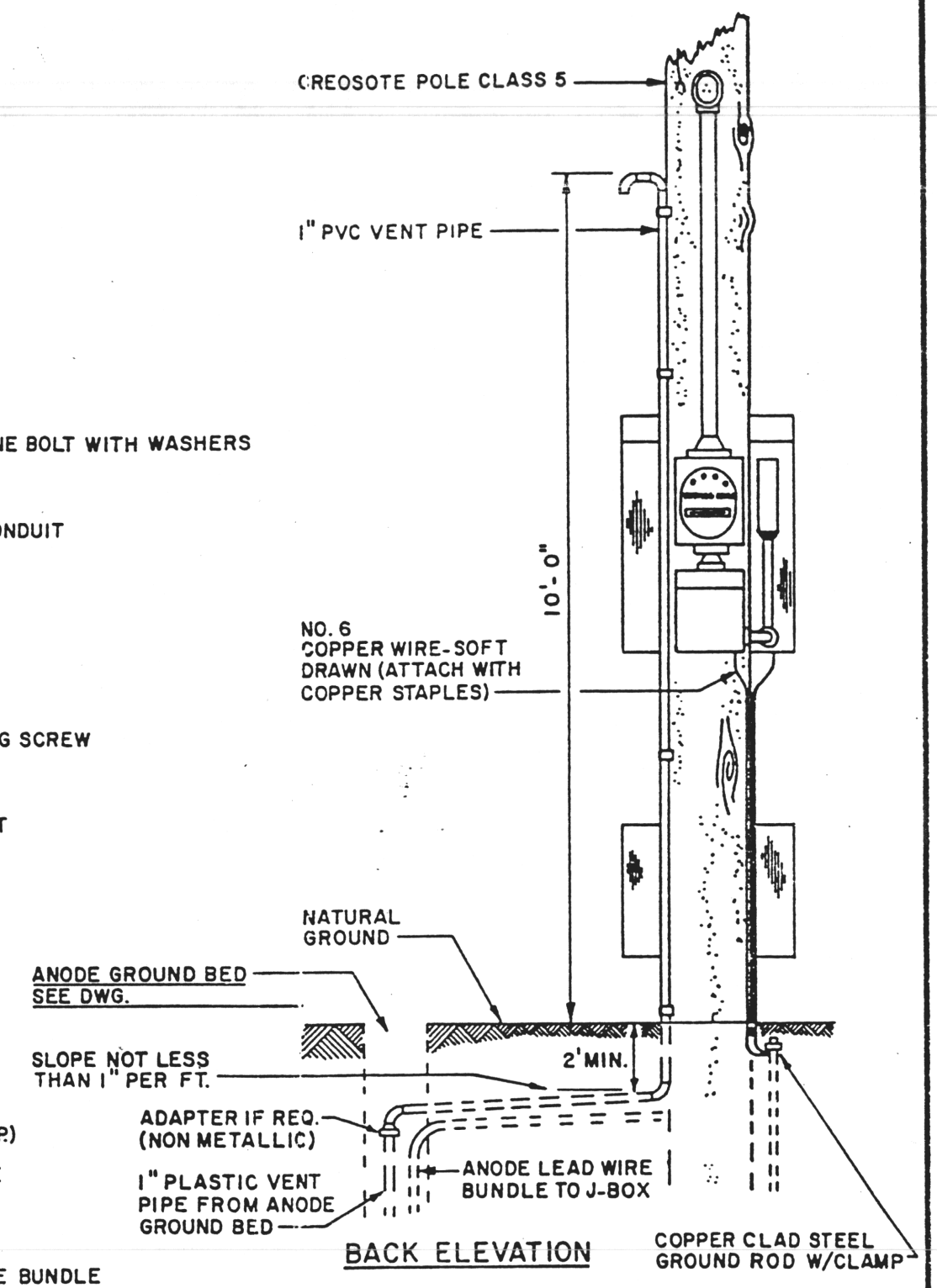
NOTES:

1. ALL MATERIAL TO BE FURNISHED BY



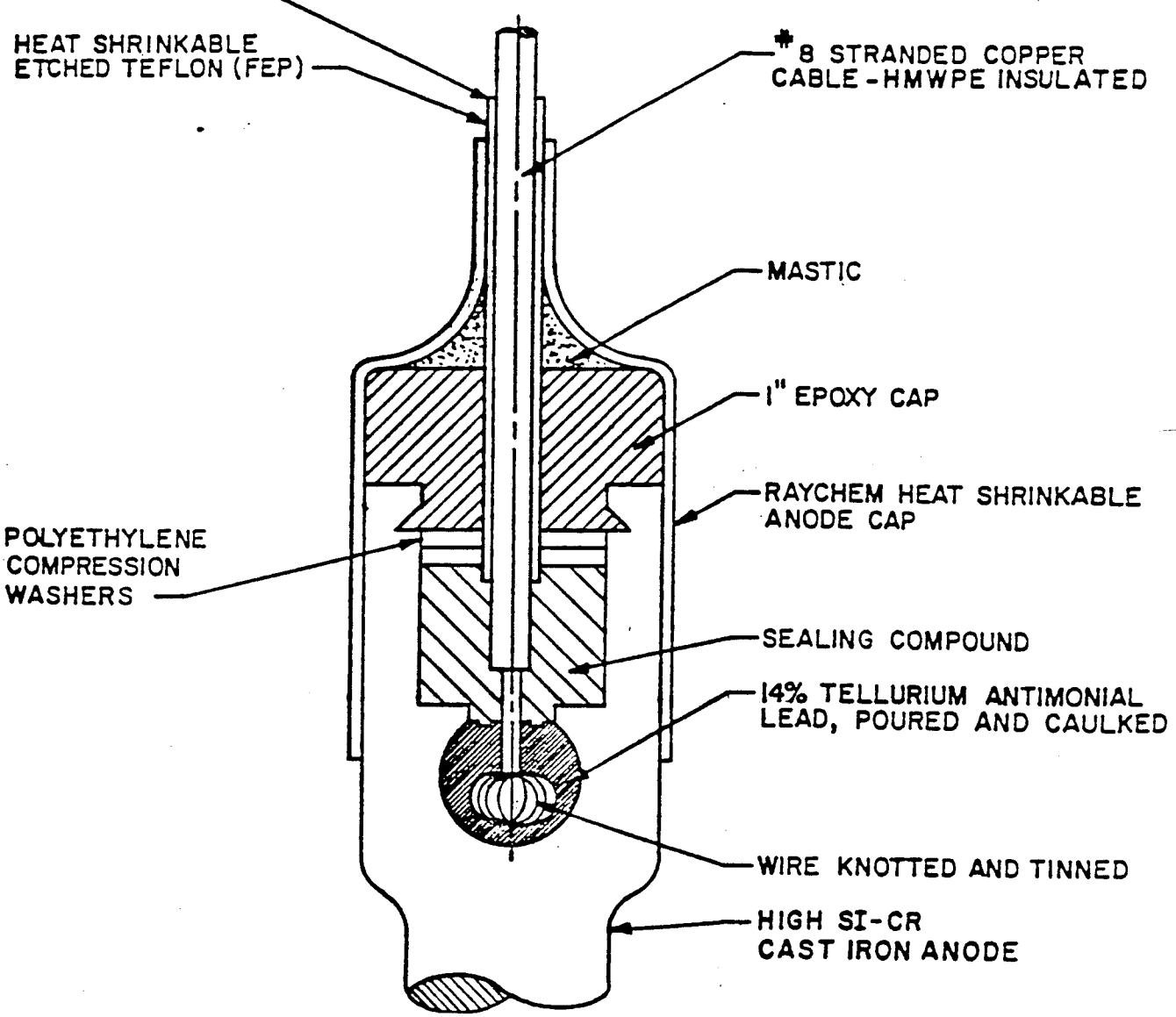
BACK ELEVATION

CATHODIC PROTECTION

ALL AMERICAN PIPELINE

TYPICAL RECTIFIER INSTALLATION

SCALE	DRAWING NUMBER
N.T.S.	FIGURE 2-4

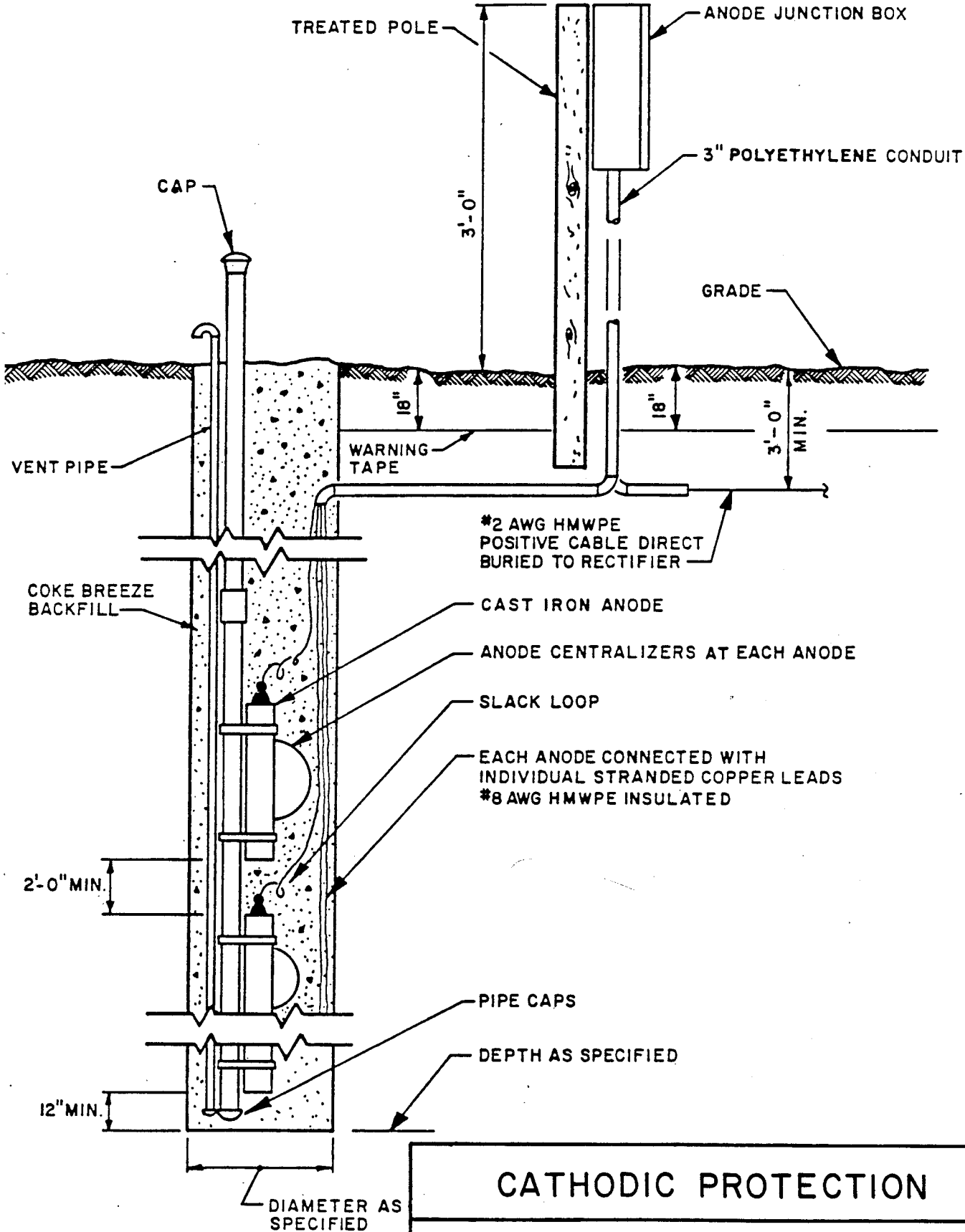


CATHODIC PROTECTION

ALL AMERICAN PIPELINE

TYPICAL CAST IRON ANODE

SCALE	DRAWING NUMBER
N.T.S.	FIGURE 2-5



CATHODIC PROTECTION

ALL AMERICAN PIPELINE

TYPICAL DEEPWELL GROUNDBED

SCALE	DRAWING NUMBER
N.T.S.	FIGURE 2-6

After the revisions are completed, they will be submitted to all parties on the spill plan distribution list. It will be required that the revised pages physically replace those pages being revised in order to minimize confusion by having two or more pages containing the same page number or items.

2.6 SPILL POTENTIAL

The purpose of this section is to describe the potential oil spills associated with the proposed project. Quantification of these risks and impacts requires: 1) estimates of the probability of an accident leading to an oil spill and possible spill magnitudes; 2) a description of exposure of potentially sensitive target areas to spilled oil; and 3) an assessment of the adequacy of proposed oil spill countermeasures to minimize the likelihood or severity of a spill.

The major assumptions that underlie the oil spill risk analysis include the following:

> Past accident frequencies can be used to predict future accident frequencies.
>
> Accidents are statistically independent and random and are sufficiently uncommon (especially major spills) that their probabilities may be described through a statistical relationship called a Poisson distribution.
>
> Although it is not feasible to assess the risks of all foreseeable types and circumstances of oil spill incidents, the ranges of possible impacts can be estimated from analysis of selected individual oil spill scenarios.

The impacts discussed for oil spill potential are classified as significant or not significant based on the degree of impact to sensitive resources. The criteria that follow are derived from regulatory standards, research information, and/or the best professional judgement of resource specialists.

2.6.1 Historical Data

The available historical data for pipeline oil spills have been analyzed by various investigators in terms of different "exposure variables". In the present context, an

"exposure variable" is a measureable (or countable) physical quantity which bears some direct and preferably simple connection to the production or transportation of oil, and which can be related to the statistical probability of an oil spill. The exposure variables most commonly used to describe the risk of an oil spill from pipeline operations are:

> volume of oil handled, e.g., the probability of a spill is described in terms of number of spills per billion barrels provided or handled; and,
>
> miles of pipeline operational per year, e.g., the probability of a pipeline spill is described in terms of number of spills per mile of pipeline operating per year.

Different investigators have emphasized one or another of these exposure variables according to the information they now have or expect to have available for risk prediction. In the discussion below, historical accident statistics are presented using several exposure variables. Based on the conclusions of the Oceanographic Institute of Washington (1978), this study selected pipeline mileage as the best exposure variable. This variable allows an evaluation of all the available data for risk estimation.

The various causes of U.S. pipeline accidents over the 5-year period from 1971 to 1975 (U.S. EPA 1982) are shown in Table 2-1. As shown, pipeline faults, including defective pipe and corrosion, accounted for 56 percent of the spills and 53 percent of the volume spilled. Loss of pipeline integrity due to internal corrosion is the largest cause of a spill and is more characteristics of older pipelines which were constructed of different materials. Spill size associated with corrosion is substantially smaller than a spill resulting from seam failure, the second largest source of pipeline fault spills. In the category of impact damage, equipment impact is the largest cause of spills. The largest volume of oil spilled is also attributed to equipment impacts.

Researchers for the Las Flores Marine Terminal Design Project found that the historical rate of oil spills from onshore pipelines has been estimated by numerous studies using pipeline mile-years as an exposure variable. The Oceanographic Institute of Washington (OIW 1978) calculated spill rates based on U.S. Coast Guard Pollution Incident Reporting System (USCG PIRS) data for the period 1973-1977.

TABLE 2-1

CAUSES OF PIPELINE OIL SPILLS BASED ON HISTORICAL U.S. STATISTICS

1971 - 1975

Cause	Percent of Spills	Percent Volume Spilled
System Fault		
Defective Pipe		
Seam Failure	12	25
Weld Failure	4	6
Other	1	4
Corrosion		
Internal	31	12
External	8	6
Impact Damage		
Equipment Impact	31	26
Excavation Equipment	3	7
Non-Impact Damage		
Natural Causes	4	7
Flow Control Error	2	3
Other Failure	1	3
Other	3	1
TOTAL	100	100

During this period, 1,580 spills, 2.4 barrels (100 gallons) or larger in size, were recorded for a cumulative total of 728,000 mile-years of pipeline. The inferred rate of spillage for spills larger than 2.4 barrels is 2.2×10^{-3} spills per pipeline mile-year. The size distribution of oil spills stemming from accidents to onshore pipelines has been evaluated by OIW and is shown in Table 2-2. It must be noted that these figures are based on a U.S. pipeline nationwide average diameter of 10 inches.

TABLE 2-2

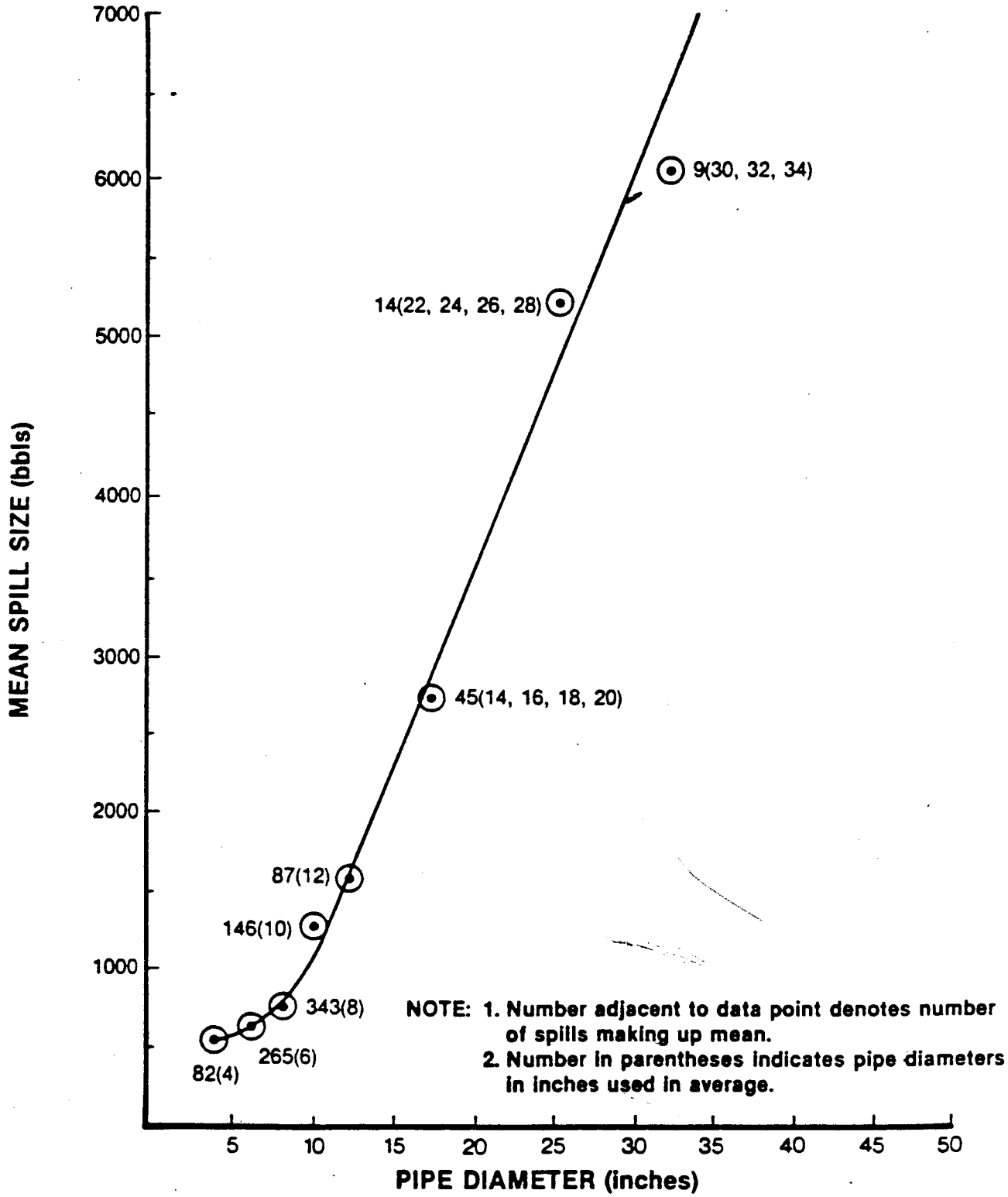
LAND PIPELINE SPILL SIZE DISTRIBUTIONS

1973 - 1977

Spill Magnitude (barrels)	Number	Percent of Total Number	Volume (barrels)	Percent of Total Volume
2.4-10	582	36.8	3,682	1.0
11-100	754	47.7	30,298	8.2
101-1,000	198	12.5	63,562	17.3
1,001-10,000	41	2.6	147,541	40.1
10,001-100,000	5	0.3	123,091	33.4
TOTAL	1,580	100.0	368,174	100.0

U.S. EPA (1982) reports the historical oil spill rate for pipelines as 1.3×10^{-3} spills per mile-year. This spill rate refers to a "reference pipeline" that is 10 inches in diameter and 25 years old. The reference line is buried 3 feet deep and has corrosion protection.

Pipeline spill rates are known to vary as a function of age and size. Figure 2-7 shows the mean spill size and line diameter for pipeline accidents reported to the Office of Pipeline Safety and Operations (OPSO) 1971-1975. For 30 to



Source: Mastandrea 1982

FIGURE 2-7. MEAN SPILL SIZE AND PIPE DIAMETER FOR ACCIDENTS REPORTED TO OPSO, 1971-1975

34-inch pipelines the mean spill size is around 6,000 barrels. Specifications in the Non Destructive Evaluation model included diameter, length, throughput, age, elevation, pressure, pump shutdown time, valve spacing and closure times, and spill prevention and countermeasures.

Spill potential for the Operator's line is anticipated to be much lower than the national average in its initial stages (DEIS 1984). The figure quoted in the DEIS, 1.6×10^{-3} is the average spill potential for a "typical" 10" line 25 years old (DEIS 1984). A study prepared by Douglas Russell Associates, Inc. (1985) for the Operator's proposed line in Texas noted that the spill potential for a 30" crude line was 70% less than that for a 10" line as described by Mastandrea. The revised spill potential for the 10" typical line is 4.8×10^{-4} spills/mile-year greater than 55bbl.

Many factors must be considered when determining a spill potential. The increased wall thickness and additional hydrostatic testing have a positive influence on the spill potential. Likewise, the fact that spill potential in the initial phases will be lower than the national average has a positive affect on the spill potential. For these and other reasons, the spill potential at the Colorado River crossing, 9.6×10^{-3} [4.8×10^{-4} spills/(.05 mile-year (40)], is very conservative.

2.7 FINANCIAL RESPONSIBILITY

Financial responsibility for containment and clean-up of an oil spill is defined in Paragraph A-7 of the BLM Grant of Right-of-Way as stated,

> "Holder shall abate any condition existing with respect to the construction, operation, maintenance, or termination of the pipeline system that causes or threatens to cause serious and irreparable harm or damage to any person, structure, property, land, fish and wildlife and their habitats, or other resource. Any structure, property, land, fish and wildlife habitat, or other resource harmed or damaged by Holder in connection with the construction, operation, maintenance or termination of the pipeline system, regardless of fault, shall be reconstructed, repaired, and rehabilitated by Holder to the written satisfaction of the Authorized Officer. Holder shall be liable to third parties in accordance with applicable law for loss or damage to property of others or for bodily injuries to or the death of any person arising from or connected with the construction, operation, maintenance, or termination of the pipeline system."

3.0 SPILL RESPONSE

3.1 COMPANY RESPONSE

The Operator's spill response may be divided into primary, secondary and tertiary responses. Figure 3-1 shows the critical path which provides decision making criteria to the Mesa, Arizona District Manager. The immediate response to a spill is to contact the National Response Center at 800/424-8802. The primary response consists of notification of company and agency supervisory personnel and initiation of spill response procedures. Agency personnel phone numbers and addresses are given in Table 3-1 It is the responsibility of the Mesa, Arizona District Office to contact the numbers listed in Table 3-1. It is the responsibility of the various agencies to contact additional personnel not shown in Table 3-1. Also, identified in Table 3-1 are the phone numbers and addresses of local emergency response agencies (i.e. sheriff's department, police department, fire department, etc.). Secondary response includes notification of contract personnel retained for spill containment and clean-up and company management. The tertiary response includes notification of appropriate outside personnel and initiation of clean-up prodedures.

3.1.1 Objectives

The major objective of the primary response is to immediately initiate procedures that insure the safety of persons in the vicinity of the spill, the preservation of property and the integrity of the environment. The primary response can be initiated in two ways: spill identified by maintenance personnel; spill identified by control center personnel. Spills identified by maintenance personnel are anticipated to be minor, as major spills will be immediately identified by the SCADA system. Control center personnel can identify major and minor spills. The primary objective of the secondary response is to provide on-site personnel and equipment as quickly as possible. Other objectives include notification of all appropriate company personnel and establishment of information networks. The tertiary response provides for clean-up of the spill and involvement of appropriate outside personnel.

3.1.2 Response Procedure

All spills in the Colorado River will be considered major spills. Operator response responsibilities during a major spill are outlined in Figure 3-2.

TABLE 3-1.
RESPONSE SUMMARY SHEET

RESPONSE TEAM		ACTION	TIME RESPONSE
Sheriff's Department	1)	Close culverts	1-2 hours
	2)	Set assigned booms	2-3 hours
	3)	Close river	0-1 hours
Wildlife - Agencies	1)	Assist in containment	1-6 hours
	2)	Evaluate impact to wildlife resources	1-6 hours
	3)	Begin capture of oiled individuals	1-6 hours
Company Personnel	1)	Direct and Assist containment	1-6 hours
	2)	Initiate and conduct clean-up activities, including temporary storage for soiled sorbent material	1-6 hours initial; finish - indefinite
	3)	Initiate and conduct restoration activities	Indefinite

FIGURE 3-1

CRITICAL PATH FOR OIL SPILL ACTIVITIES

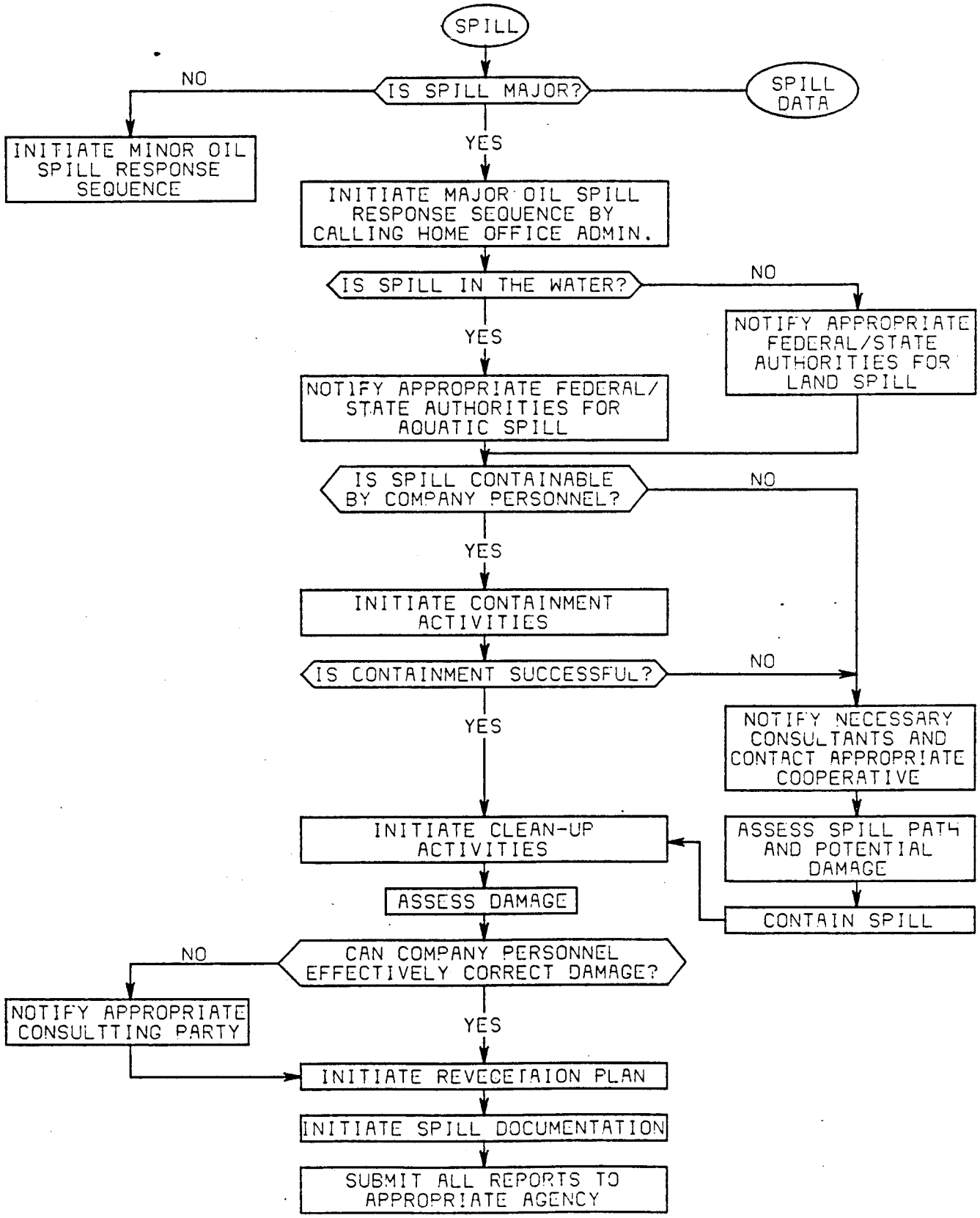
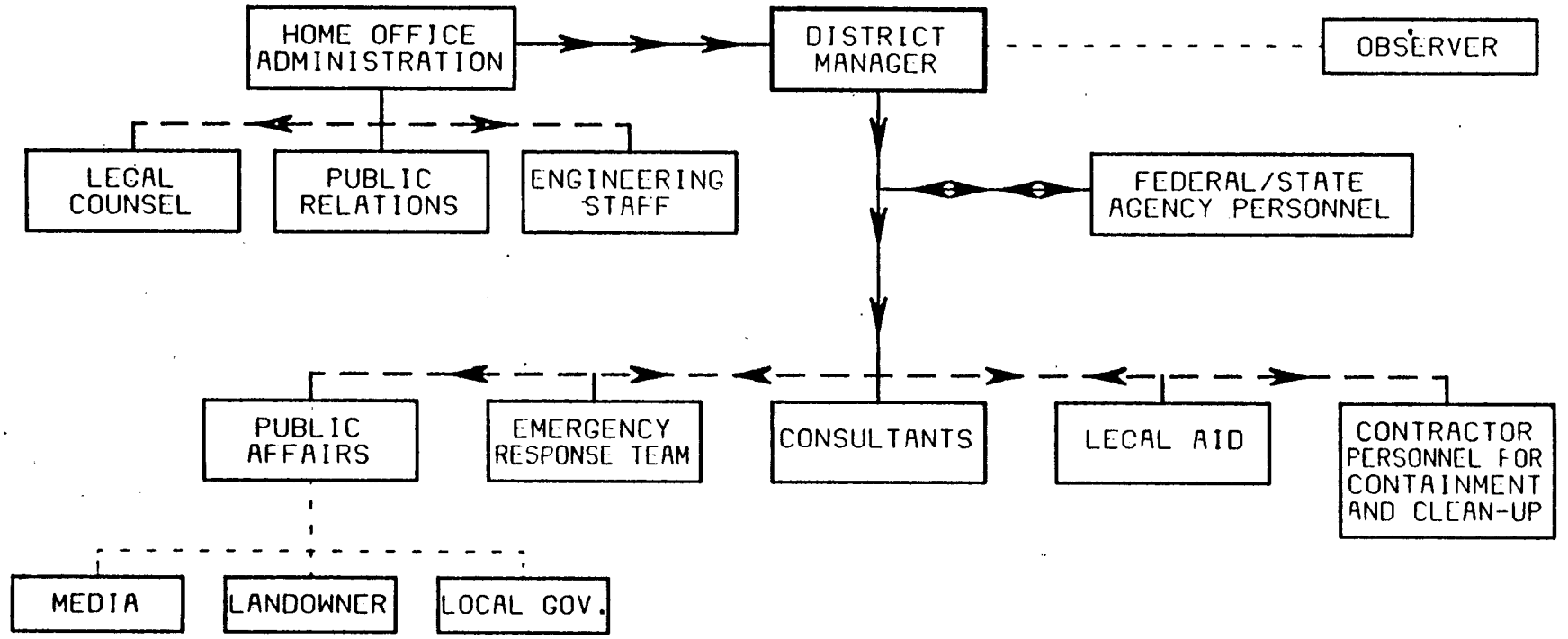


FIGURE 3-2

OPERATOR PROCEDURE SCHEMATIC FOR MAJOR SPILL



The home office will provide auxiliary support in the areas of legal counsel, public relations, and engineering and will also provide direction and decision-making support to the District Manager.

The Emergency Response Team (ERT), shown in Figure 3-3, will be headed by the District Manager. The ERT leader will provide decision making and guidance in the event of a spill. The ERT leader's responsibilities include:

1) Assignment of company and contractor personnel;
2) Supervision of spill control;
3) Liaison for the company with government agencies in lieu of a public relations coordinator;
4) Training of company personnel;
5) Company preparations (storage of materials, etc.); and,
6) Preparation of necessary paperwork.

The field coordinator (most likely the maintenance supervisor) will be responsible for supervision of company and contractor personnel at the spill site. He will be the company representative at the spill site in the absence of higher authority.

The safety coordinator will be responsible for:

1) Assistance with assessing spill damage and potential;
2) Supervision of safety measures and standards for company personnel; and,
3) Providing guidance and preparation of safety measures and standards.

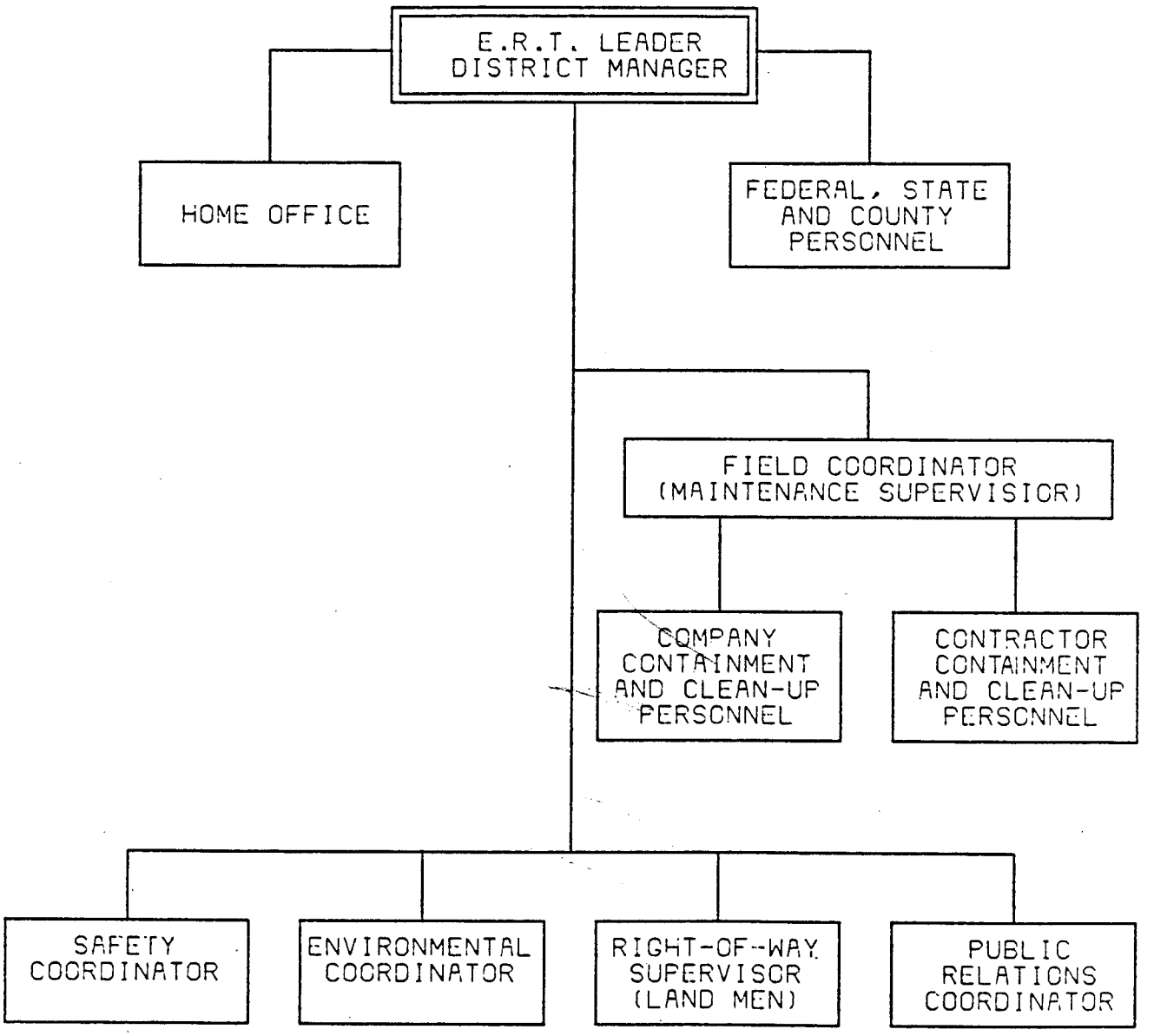
The evironmental coordinator will be responsible for:

1) Periodic assessment of company spill preparedness;
2) Periodic review of the spill contingency plan;
3) Distribution of technical and training data to appropriate company personnel;
4) Restoration and rehabilitation of spill site(s); and,
5) Disposal of contaminated spill material.

The right-of-way supervisor will be responsible for contacts and right-of-way access from landowners. He may also act as liaison between the company and the landowner. The public relations coordinator will be responsible for assisting the ERT leader with communications between the company and governmental personnel. He will not be responsible for news/media interaction or releases. Those will be handled, if any are prepared, through the home office.

FIGURE 3-3

EMERGENCY RESPONSE TEAM INTERACTION



3.1.3 Spill Notification Procedures

Upon notification that a spill has occurred the Mesa District Manager will contact the priorty agency phone numbers depicted in Table 1-3 using Figure 3-4 as a guide for providing information during the contact phone call. The first contact will be the Riverside County Sheriff's Department, as shown in Table 1-3. The Sheriff Department personnel will be responsible for closing the levee culvert covers, for deploying the diversion booms at the two designated quiet water areas, and will close the river to boat traffic.

Next, the three wildlife agencies (California Fish and Game, Arizona Game and Fish, and U.S. Fish and Wildlife Service) will be contacted. Wildlife agency personnel will assist in containment, evaluate spill impacts, and capture oiled individuals.

The next contacts will be emergency centers. These include the National Response Center, the California Office of Emergency Services, and the Arizona Department of Public Safety Watch Commander.

Company personnel, including contractor personnel, are responsible for containment, clean-up, and restoration. Table 3-1 provides a summary sheet of response activities. Phone numbers for the contacts are shown in Table 1-3 which should be placed in a prominent area on the bulletin board.

3.2 FEDERAL RESPONSE

Section 311(c)(2) of the Federal Water Pollution Control Act of 1970 requires that a National Oil and Hazardous Substance Pollution Contingency Plan be prepared. This plan was established in 1973 and amended in 1975. This National Contingency Plan (NCP) includes provisions for the assignment of clean-up responsibilities to various Federal agencies in cooperation with state, local and company personnel, establishment of a national center for direction of spill activities, and establishment of strike and task forces. The National Response Team (NRT) is responsible for implementation of the NCP and includes representatives of all U.S. Department Secretaries. The Federal agency (U.S. Fish and Wildlife Service/EPA) involved will provide an On-Scene Coordinator whose responsibilities include assisting the company personnel and activation of the Regional Response Team, Pacific Response Team, and/or State Response Team as necessary.

FIGURE 3-4
FORMAT FOR ORAL NOTIFICATION
OF GOVERNMENT AGENCIES

1) Name, position and company

2) Name of facility

3) Location of spill

- Township, Range, Section;
- Parcel number.

4) Date and time of spill

- Time spill began or;
- Estimated time spill began;
- Duration of spill.

5) Extent of spill

- Material spilled;
- Volume spilled, if known, or;
- Estimated spill volume.

6) Weather and Hydrologic

- Wind speed;
- Wind direction;
- Air temperature;
- Current Velocity;
- Parker Dam Release.

7) Activities initiated

- For containment;
- For clean-up;
- Has source stopped?
- Time NRC contacted;
- Estimated time of containment.

3.3 STATE RESPONSE

3.3.1 California

The State of California Spill Contingency Plan was prepared for coordination of State agency personnel response. It provides a detailed and descriptive narration of oil spill related actions and responsibilities. Included in these are brief descriptions of the various State and Federal department responsibilities, reporting procedures, and legal ramifications of State sponsored spill clean-up efforts.

Putman (1977) presented a synopsis of the California Spill Plan to the 1977 Oil Spill Response Workshop. He noted that in California the responsibility of oil spill activities begins with local governments and progresses to County, State, and/or Federal levels as required. The local governments assign spill response authority to an individual which represents the governmental entity and commits local resources to spill response. Putman (1977) also stated that,

> "In all cases, a uniformed officer from the California Department of Fish and Game goes to the scene and estimates the magnitude of the spill and its potential adverse effects. If the spill poses a substantial threat to public health or welfare or to living resources, arouses public concern, or is likely to be beyond the control of personnel or equipment of local organizations, he will recommend to the State Operating Authority that a pollution incident be declared.
>
> The decision as to whether to contact the State Operating Authority rests upon the judgment of the officer, rather than being tied to a factor of the specific number of gallons spilled. If, in the judgment of the officer, the extent and character of the spill do not warrant the declaration of a pollution incident, the officer will investigate the cause and monitor the containment and removal of the oil."

Under the plan, when an incident is declared the State Operating Authority (SOA) represents the State on the Federal response team and has the authority to initiate the State Spill Contingency Plan (SSCP) by declaring an oil spill emergency. Initiation of the SSCP requires the formation of the State Support Team (SST) which includes the department heads of various agencies concerned with the spill contingency. The SST authorizes the SOA to act and administers a State Interagency Oil Spill Committee (SIOSC) which functions as a

liason between public and private oil pollution control organization and reviews and implements pertinent portions of the SSCP. It does not have any direct authority. The SOA, upon authorization to act, designates a State Agency Coordinator whose primary responsibility is to coordinate the various state agencies responding to the spill. These agencies comprise the State Operating Team. Figure 3-5 illustrates the state pollution incident response organization. Figure 3-6 depicts the state agency scene management system structure.

3.3.2 Arizona

The Arizona spill contingency plan is cursory in its treatment of response, being more detailed in the definition of State and Federal departmental responsibilities and terms associated with spill activities. The Department of Public Safety, Division of Arizona Highway Patrol (DPS/AHP) acts as the lead agency in spill scenarios. DPS/AHP Commercial Vehicle Safety Specialists (CVSS) are the designated State On-Scene Coordinators.

3.3.3 Local

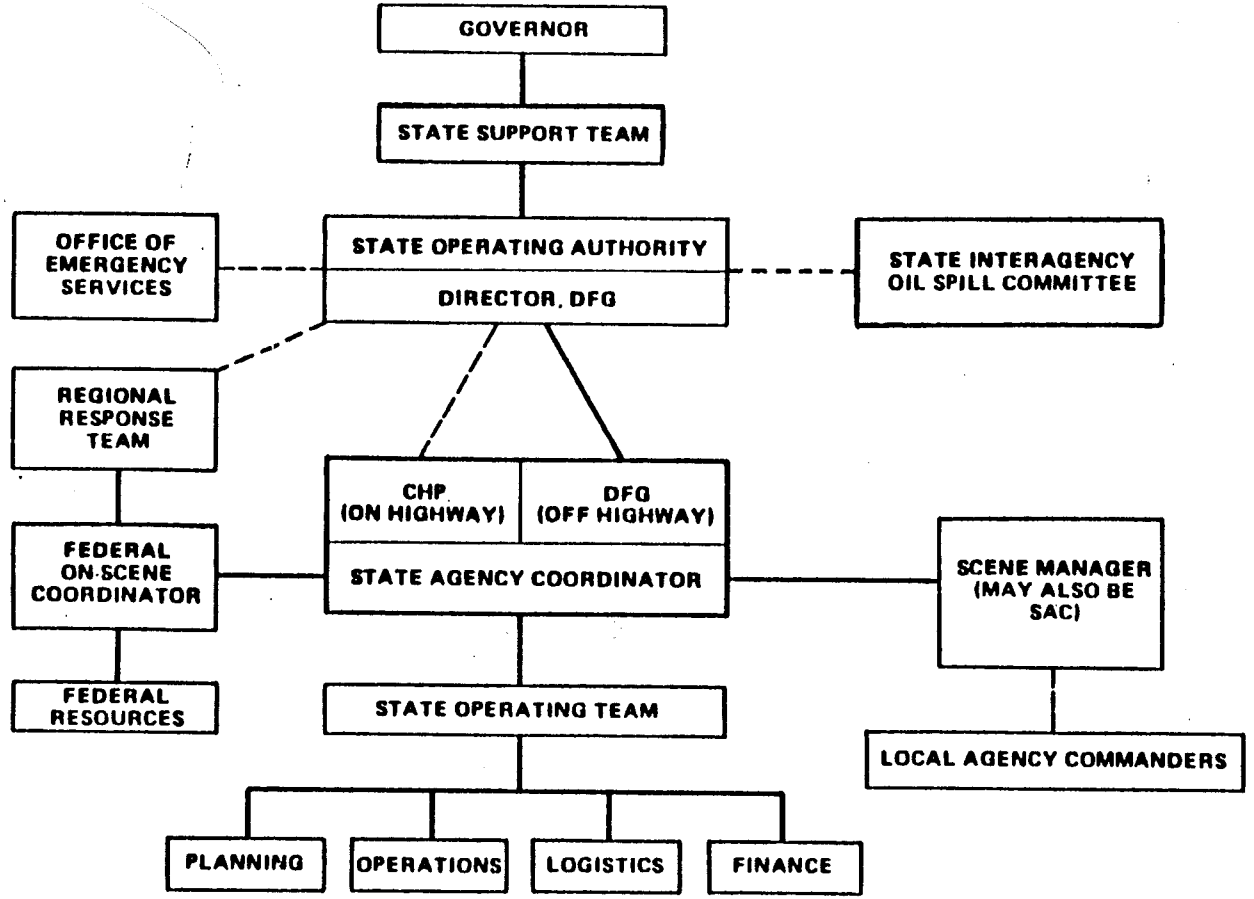
Upon notification that a spill has occurred, the Riverside County Sheriff's Office in Blythe, California will dispatch two sets of personnel. The first set will consist of two persons (one for the Arizona side and one for the California side) whose responsibilities are to close the culvert covers as located on Figure 4-15. The second set of personnel will be one or two three-man teams trained for diversion boom deployment. Preferably, two three-man crews will be activiated; however, one three-man crew can deploy both diversion booms if necessary. The Sheriff's Office will, at their discretion, close the Colorado River to boat traffic. Specific information on diversion boom deployment is located in Section 4.2.1.1.

3.4 RESPONSE ROUTES

Response routes to the Colorado River are primarily levee roads constructed by the Bureau of Reclamation. These are shown on the Bureau of Reclamation Facility Map of the Lower Colorado River. Facility Map Sheets 1-8, Mexico to Blythe, California, are shown in Figure 3-7. Also provided, in Figure 2-8, are the county maps for the four counties which may be involved in a spill: Riverside and Imperial Counties, California, and La Paz and Yuma Counties, Arizona. Use of these maps indicate all access routes to River Mile (R.M.) 89, which is the approximate termination of the northern levees and berms. Access from R.M. 89 to R.M. 50

FIGURE 3-5

STATE OF CALIFORNIA POLLUTION INCIDENT RESPONSE ORGANIZATION



NOTE: DASHED LINES REPRESENT INDIRECT LINES OF AUTHORITY.

FIGURE 3-6

STATE OF CALIFORNIA AGENCY SCENE MANAGEMENT SYSTEM STRUCTURE

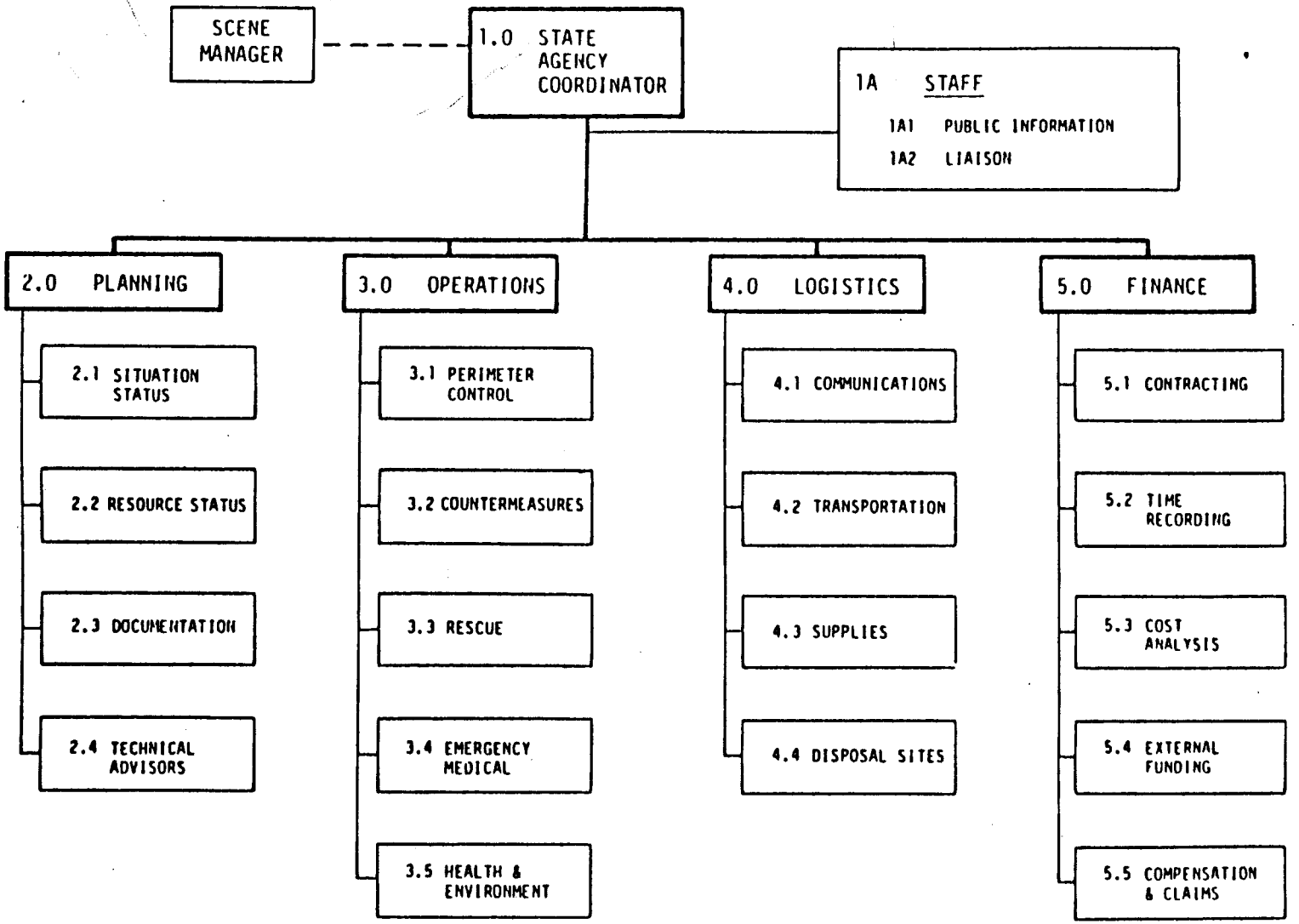


FIGURE 3-7.

BUREAU OF RECLAMATION FACILITY MAP OF THE LOWER COLORADO RIVER, SHEETS 1-9, MEXICO/UNITED STATES BORDER TO BLYTHE, CALIFORNIA.

Please see Figure 2-3 for Facility Map 9 of 20.

is primarily limited to boat or air. River berms and levees, and their associated roads, begin again at R.M. 50 and extend to the U.S./Mexico border (R.M.O).

Data provided by the Boulder City, Nevada Office of the Bureau of Reclamation (B.R.) depict the various flow rates and velocities (Table 3-3) of the Colorado River approximately 10 miles downstream from the AAPL crossing. B.R. personnel indicated that these data approximated those for the AAPL crossing. Table 3-3 can be used to estimate river velocity based on the thousand cubic feet per second (MCF/S) flow rate values. Estimated river velocities can be used for planning where diversion and containment booms should be placed relative to the anticipated velocity of the spill.

TABLE 3-3
VELOCITY CHART FOR AAPL PIPELINE
CROSSING OF THE COLORADO RIVER.

MCF/S	VELOCITY (F/S/FT/H)	KNOTS	MPH
5	2.3/8280	1.4	1.6
10	3.2/11520	1.9	2.2
15	3.8/13680	2.3	2.6
20	4.4/15840	2.6	3.0
25	4.8/17280	2.8	3.3
30	5.3/19080	3.1	3.6
35	5.7/20520	3.4	3.9
40	6.2/22320	3.7	4.2

4.0 SPILL CONTAINMENT

The initial on-the-ground procedure for any spill is containment. Surface spill containment methodology is contingent upon the size of the spill and associated terrain. On land, flat terrain poses the most difficult problem while ditches and ravines lend themselves to simple, efficient containment procedures. The most difficult aquatic oil spill to contain occurs in fast flowing streams/rivers while sluggish streams and ponds/lakes are the easiest to contain.

A list of spill equipment is given in Table 4-1.

4.1 SITE SPECIFIC

The primary form of spill containment on the Colorado River will be the use of three (3) diversion booms deployed in a cascading fashion. The booms will divert oil into two (2) designated quiet water areas as shown in Figure 4-7. Additional diversion booms will be placed at strategic openings to the Colorado River, as shown in Figure 4-7, and as needed. The methodology for spill containment is discussed in detail in Section 4.3.

4.2 TERRESTRIAL SPILL CONTAINMENT

Terrestrial oil spill containment can generally be classified into four topographic groups: flat terrain, depressions, downhill slopes, and ravines/ditches.

4.2.1 Flat Terrain

The major containment mechanism in flat or gently sloping terrain is the construction of berms around the spill. The berm is to be of a sufficient height to contain the spill and is generally constructed using heavy earth moving equipment. Another method includes use of relatively non-porous materials, such as sandbags, haybales, and plastic sheeting.

4.2.2 Depressions

Depressions generally act as natural containment areas. Should the depression not be of sufficient size to contain a spill, berms similar to those used for flat terrain may be constructed so that the depression can contain the maximum amount of spilled crude.

TABLE 4-1.
LIST OF SPILL RESPONSE
EQUIPMENT LOCATED AT
COLORADO RIVER CROSSING
AND ASSOCIATED DISTRICT WAREHOUSES.
(Bakersfield and Mesa).

BOOM MATERIAL

1,500 ft 6" X 12" Acme O.K. Corral Containment/Diversion boom at each Quiet Water Area (QWA)
800 ft 6" X 12" Acme O.K. Corral boom at each warehouse

Total - 4,600 ft 6" X 12" boom

SORBENT MATERIAL

9,000 sq.ft. 36" X 150' X 3/8" (20 rolls) sorbent roll at each QWA
45,000 sq.ft. 36" X 150' X 3/8" (100 rolls) sorbent roll at each warehouse

Total - 108,000 sq.ft. sorbent material

RESPONSE BOXES

One at each warehouse containing:

- 5 pitchforks
- 5 rakes
- 5 pair rubber gloves
- 2 rolls reflector tape
- 2 rolls duct tape
- 1st aid kit
- Q-beam spotlight kit
- 1 roll 3-5 mil plastic
- 3 pocket knifes and sharpener

BOAT - located in Blythe

One 18 ft. aluminum boat
One 20 hp. motor
One trailer

4.2.3 Slope Areas

The major emphasis of containment for slope areas focuses on channeling oil into nearby depressions, dammed ditches/ravines or berms similar to those utilized in flat terrain. Techniques used to channel the oil flow include construction of a ditch or non-porous berms.

4.2.4 Ravines/Ditches

Containment procedures for ditches/ravines include blocking dams and culvert blocking. Blocking dams are constructed of non-porous material in a manner which impedes progress of the spill. A series of blocking dams may be required if the spill is so large as to overflow a single blocking dam. Permanent piped bypass blocking dams can be constructed in critical ravines/washes. Permanent bypass blocking dams must be piped to allow removal of water so that they do not create reservoir situations which may overflow during a spill. Two of the most common types of blocking dams are the valved pipe and inclined pipe. Permanent structures require landowners prior approval.

The valved pipe blocking dam utilizes compacted soil or other impermeable material to construct a dam across the ravine. Located in the dam, near the bottom, is a pipe with attached relief valve. This allows the water level to be controlled during times of high rainfall or during spill containment. Its major disadvantage is that the water must be manually controlled. The inclined pipe blocking dam is constructed in a manner similar to the valved pipe dam above. The difference is that the pipe is inserted at an incline designed to regulate water by back pressure. This allows a controlled level except during times of high rainfall. Its major disadvantage is that the water level cannot be manually manipulated if required.

Generally, culvert blocking utilizes impervious dams at the upstream side of the culvert. This can be accomplished in various ways. However, the most effective technique utilizes sandbags. Whatever technique is used, it must be able to withstand the pressure created by the contained oil and sealed, to the maximum extent possible, around the mouth of the culvert. If there is water flow in the ditch, the objective is to contain the oil while allowing the water to flow. This can be accomplished by use of a specialized dam placed at the upstream mouth of the culvert. This dam allows the water to flow underneath while constraining the oil as it floats on the surface.

4.3 AQUATIC SPILL CONTAINMENT

Containment techniques used for aquatic spills include booms and culvert covers.

4.3.1 Booms

Booms are designed to contain the oil while maintaining a steady uninterrupted water flow. Booms consist of five (5) distinct parts: float; freeboard; skirt; ballast; and, tension member. Figure 4-1 illustrates the various components of a boom. The floating member of the boom provides buoyancy so that the boom is able to maintain its surface position. The freeboard is that portion that extends out of the water to prevent splash-over. The freeboard is typically the upper portion of the float. The skirt ideally provides underwater containment of the spill. Ballasts are used to weight the skirt so that it maintains its vertical position in the water column. The tension member is a vital part of the boom in that it provides an element able to withstand the forces of towing and placement of the boom. The tension member also is used to attach the float member to the skirt.

When booms are properly placed and functioning, they provide a very effective means of containing oil spills. However, outside forces, such as current or weather, cause the boom to function below peak efficiency. The two most common problems concerning booms are entrainment and splash-over. Entrainment occurs when oil is allowed to pass under the skirt (Figure 4-2) and continue downstream. The most common causes of entrainment in inland waters are current and high winds (Figure 4-3). Generally, entrainment can be corrected by decreasing the boom/bank angle of intersect. However, it should be kept in mind that as the boom/bank intersect angle is decreased, the length of boom needed increases.

Splash-over occurs when the contained crude escapes boom containment by traveling over the freeboard. According to Donohoe (1977), "Splash-over is directly affected by boom design, freeboard height, angle of approach of waves to the boom, and size and interval of the waves." While wave characteristics are more indicative of a marine environ, it is important to remember that small waves can also occur on inland waters.

Most authorities note that currents over 1.0 to 1.5 mph limit the effectiveness of boom placement due to increased entrainment. The greater the current the smaller the boom/bank angle at which the boom remains efficient. When booms

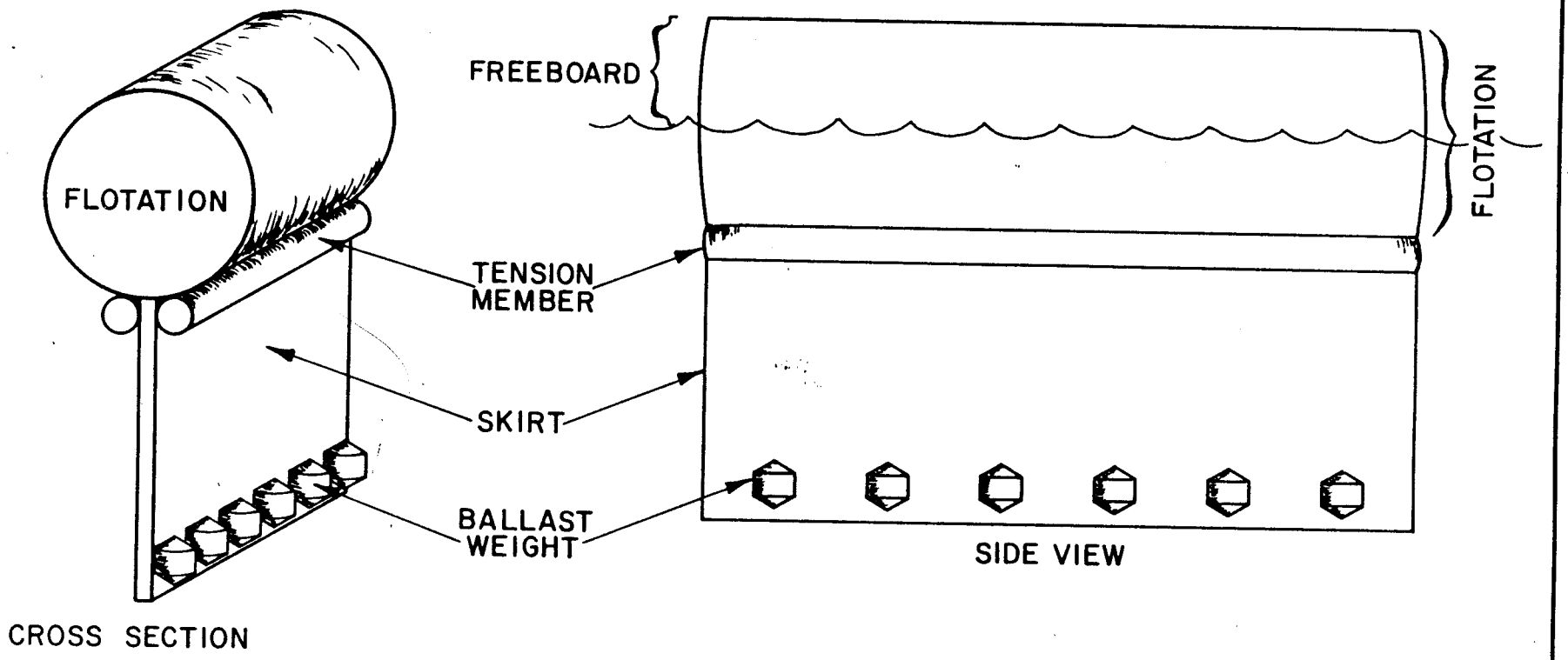


FIGURE 4-1. ILLUSTRATION OF MAJOR BOOM COMPONENTS.

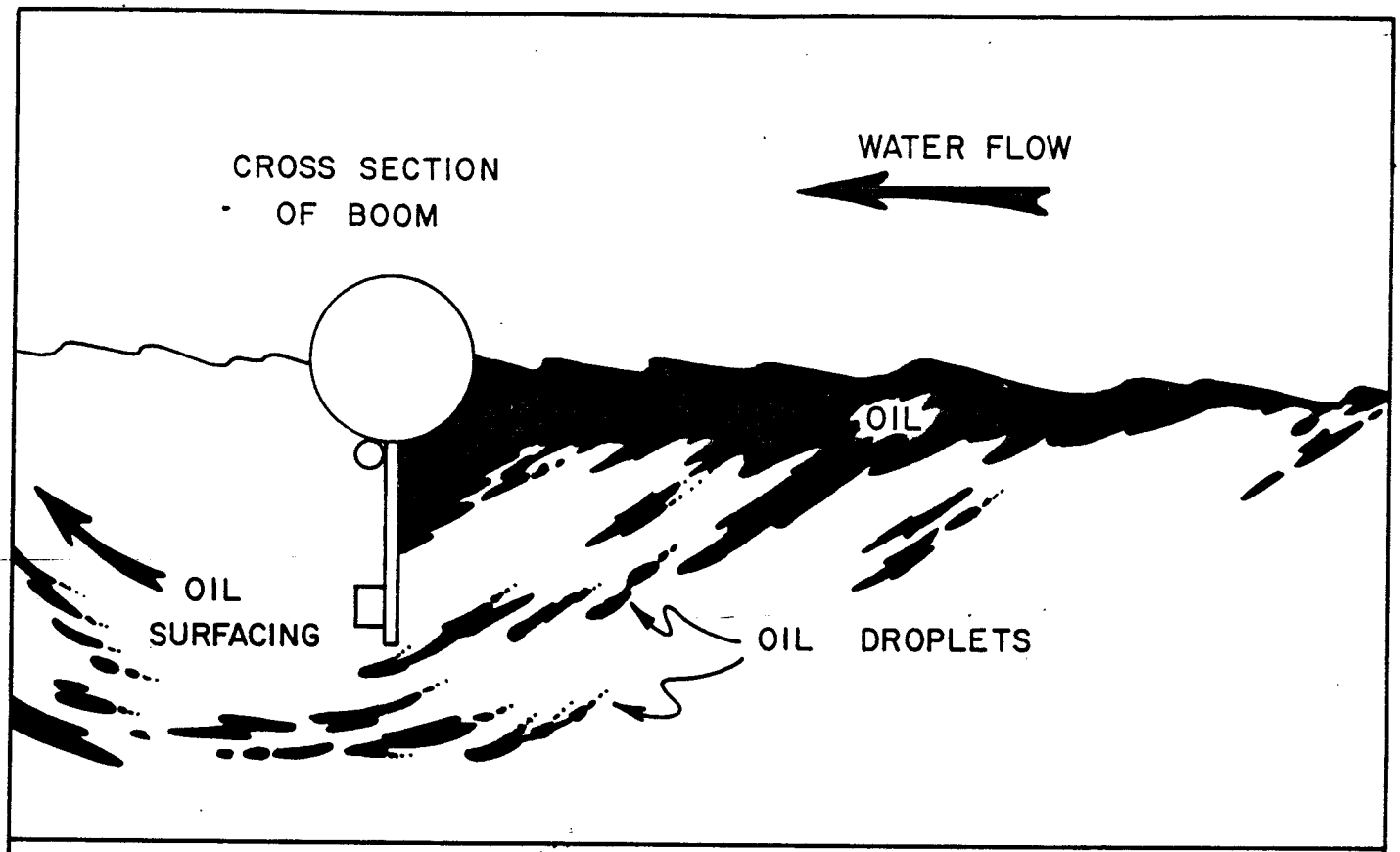


FIGURE 4-2. ILLUSTRATION DEPICTING BOOM ENTRAINMENT CHARACTERISTICS.

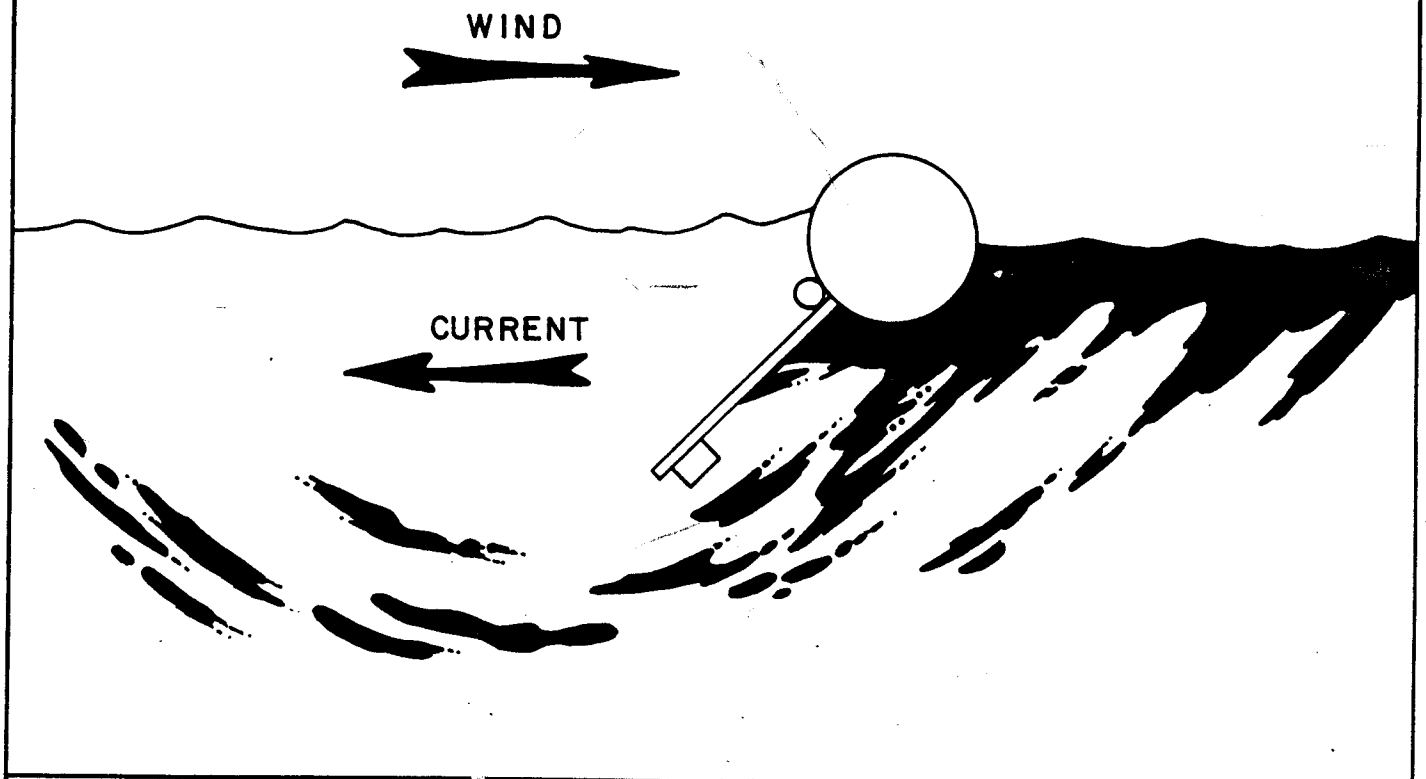


FIGURE 4-3. ILLUSTRATION DEPICTING ENTRAINMENT DUE TO WIND AND/OR CURRENT.

are to be used in moderate to high currents, (over 1.5 mph) parachute lines can be attached at strategic locales to provide some rigidity to the boom and to provide additional support. Figure 4-4 shows an example of parachute line configuration.

4.3.1.1 Boom Deployment

Effective placement of diversion and containment booms is critical to a successful compaign to contain and clean-up a crude oil spill. It is virtually impossible to provide a detailed plan for boom deployment in this manual as river and weather conditions, access, etc. cannot be determined for a future event. However, certain basics can be stated. Also, use of the B.R. Facility Map indicating the river and its adjacent features is a necessity for determining boom placement based on the specific nature of the spill.

Spills can occur on the Colorado River during two phases: high current and low current. When the Colorado River is in a high current phase, the major objective should be to transfer the oil to quiet water areas so that it can be removed by skimmer, sorbents or other method. Figure 4-5 depicts typical river channel components, including straight course, turns, feeder streams, and adjacent wetland areas. Diversion booms are used at the mouths of feeder creeks and other inlets to prevent the oil from contaminating these areas. Obviously, if a feeder stream has a high entrance flow or an inlet opens and travels back against the current (see Figure 4-5 inset), a diversion boom may not be needed. It is anticipated that during high flow one containment boom will not be adequate. Various possibilities for containment boom placement are shown in Figure 4-5. Of special interest is containment boom placement in river curves. In a river curve the fastest flow is to the bank in the direction of the curve (i.e. right river turn impacts the right bank). It should also be noted that during high flow sand bars and other river structures are underwater creating various long shore-type and undertow currents.

The low current river phase (Figure 4-6) presents a less formidable spill scenario. River structures underwater during the high current phase are now evident and, of course, the flow rates are greatly reduced allowing better boom efficiency. Diversion booms are utilized in the same manner as for the high current river phase. Containment booms can be used at greater boom/bank angles. River structures may be of use depending upon their position and make-up.

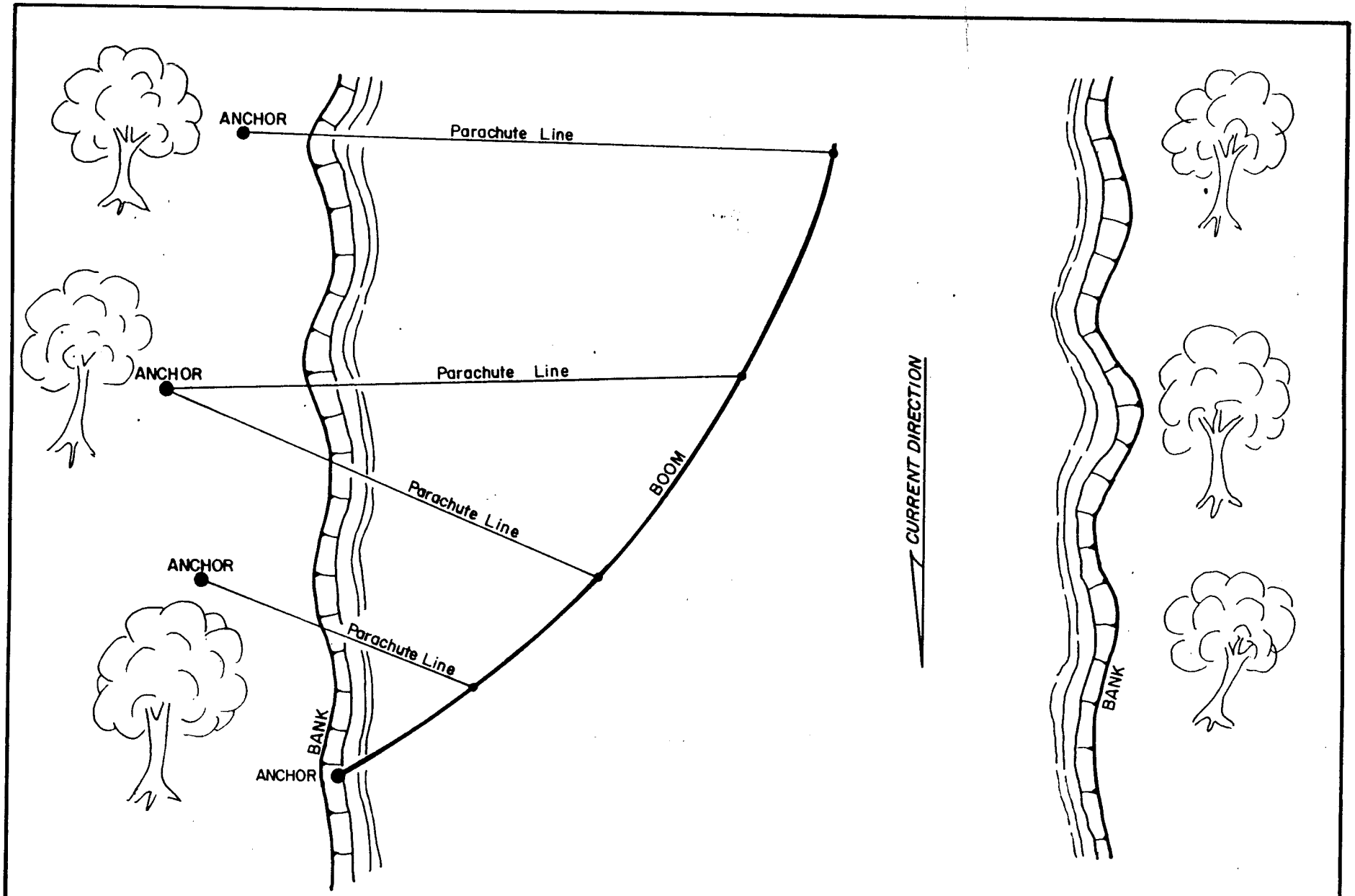


FIG. 4-4. ILLUSTRATION OF BOOM SUPPORTED BY STRATEGICALLY PLACED PARACHUTE LINES.

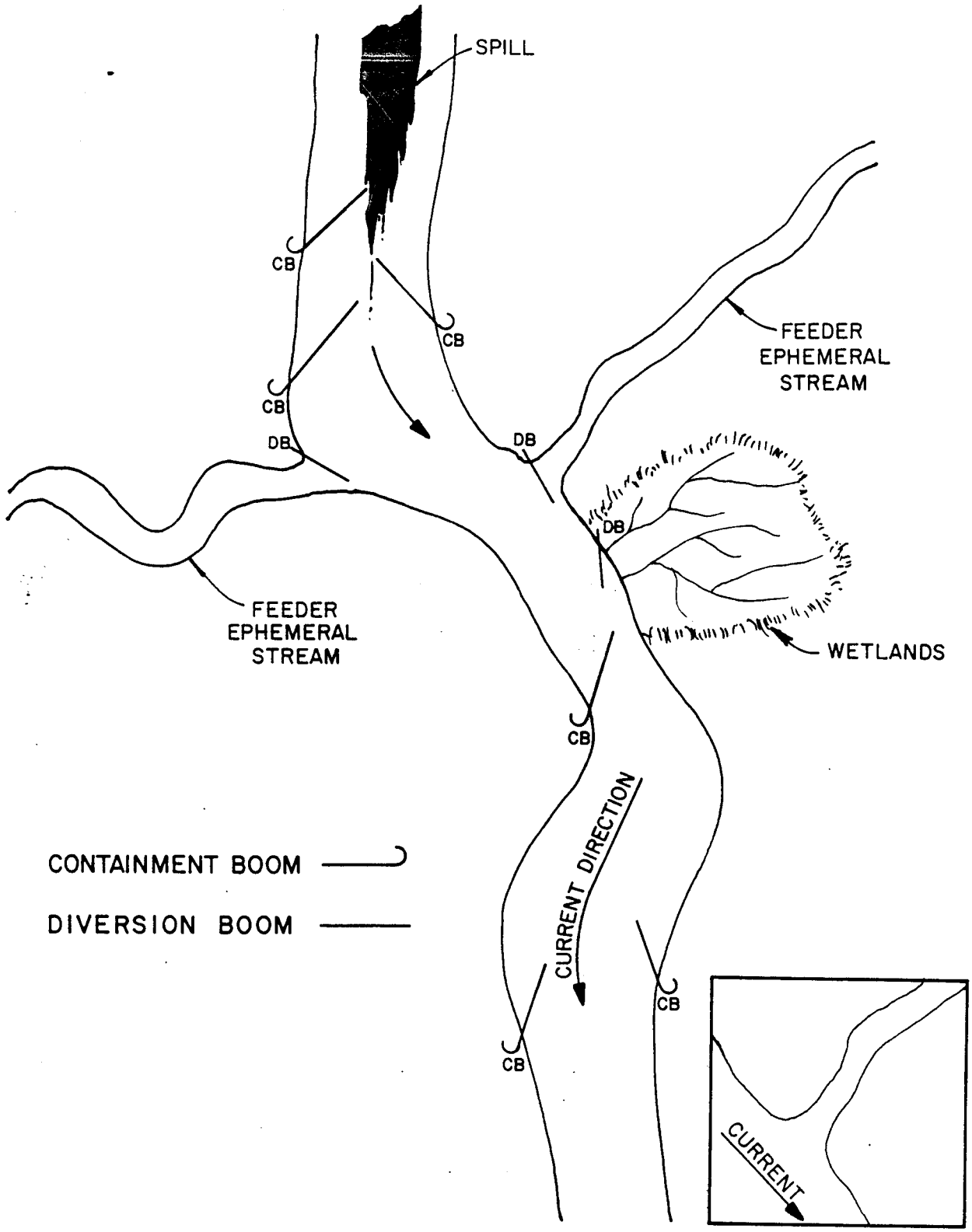


FIGURE 4-5. TYPICAL RIVER CHANNEL COMPONETS: HIGH FLOW STAGE.

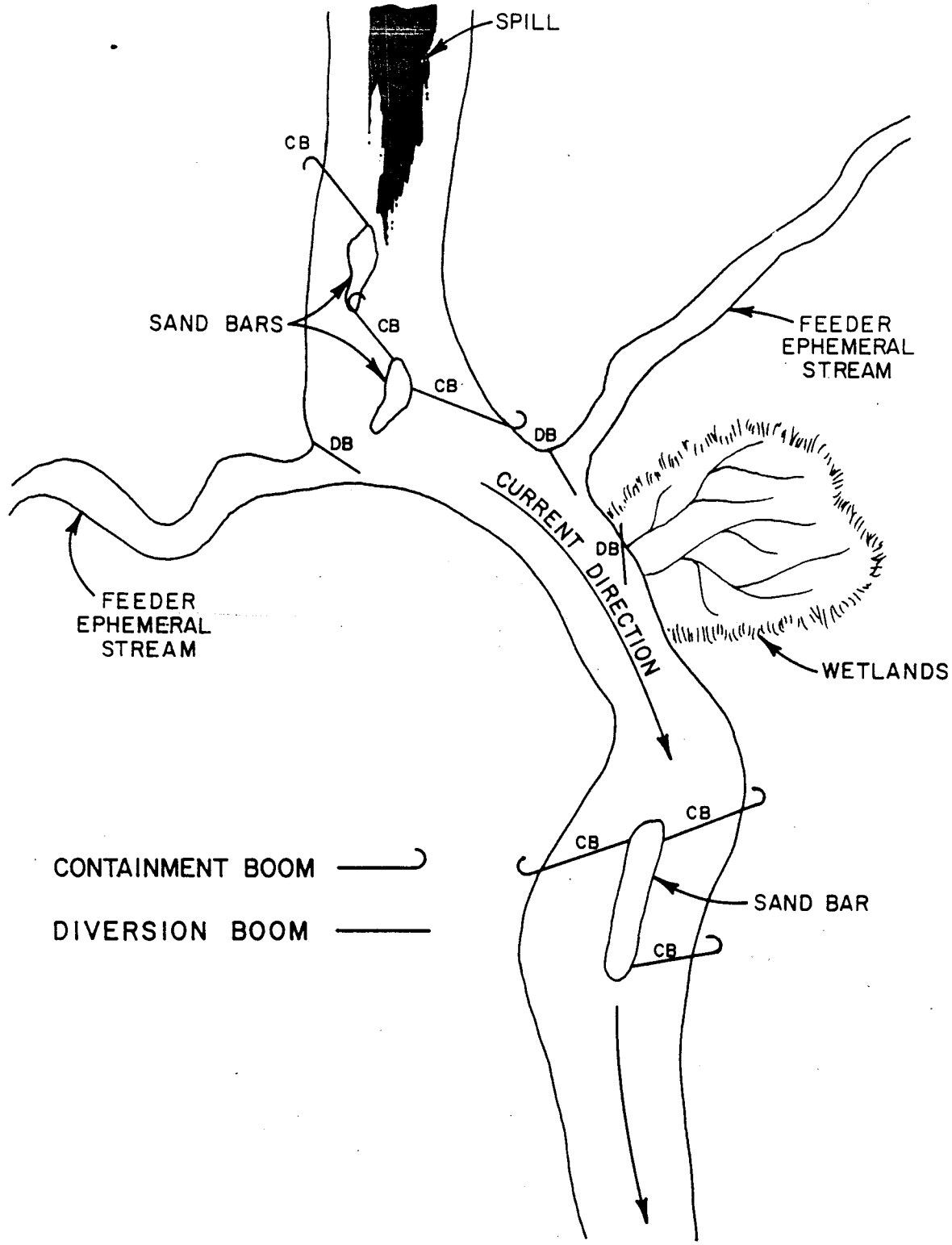


FIGURE 4-6. TYPICAL RIVER CHANNEL COMPONETS: LOW FLOW STAGE.

There are two permanent diversion boom locations which are depicted in Figure 4-7. Booms and anchors are stored on, or near, these locations. Additionally, permanent shore anchoring features are installed for ease of boom deployment. These permanant anchor sites are marked with reflective tape for ease of location. The Operator will interact with the Bureau of Reclamation to insure that these reflective locators are not destroyed by river maintenance.

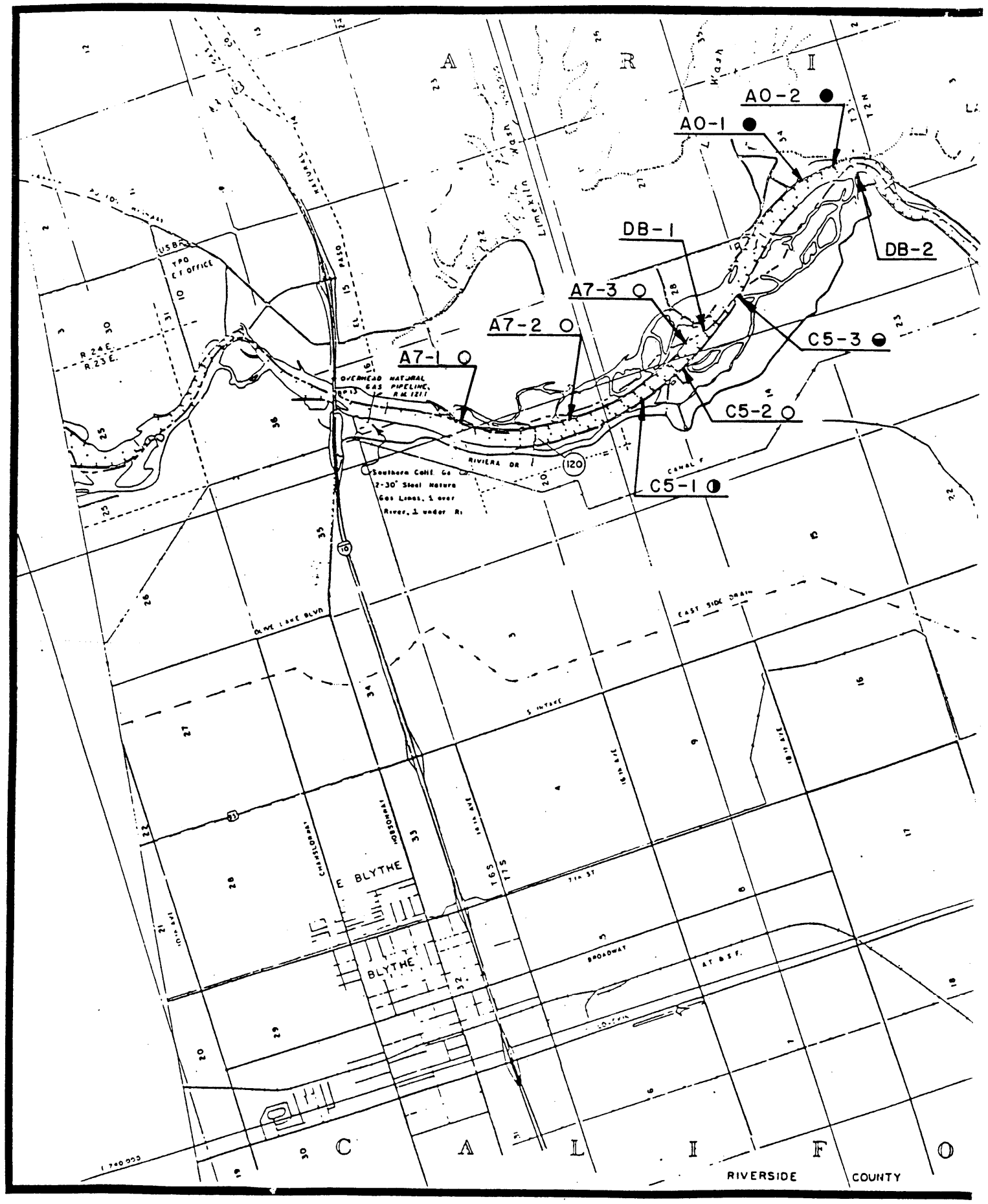
The various configurations of boom deployment are discussed in the following Section. When booms require anchoring, the anchor construction shown in Figure 4-8 should be used.

4.3.1.2 Boom Deployment Configurations

There are four methods of boom deployment: diversion; containment; staggered; and, cascading. Diversion booms can be used to prevent oil from entering sensitive areas adjacent to streams or rivers as depicted in Figure 4-9. Its major function is to divert the oil around the sensitive area to containment measures downstream. Containment boom deployment is used to prevent the oil from traveling further downriver (Figure 4-10). It requires that a boom be deployed across the waterway with the farshore anchor site being upriver from the nearshore. The distance upriver is dependent upon the size of the waterway and speed of the current. A "pocket" or collecting basin is dug by backhoe or clam to collect the crude in an area accessible by a vacuum truck. Staggered booms are used when the waterway is too wide or currents too fast for containment using a single boom. Figure 4-11 illustrates the strategy of staggered boom deployment. Two or more booms are used (at 90° angles to each other) in staggered boom deployment. The initial boom is at approximately a 45° angle upriver from the shoreline. The next boom is placed some distance downriver of the first, also at an approximate 45° angle to the shoreline. Catch basins, constructed at the intersection of the shore anchor site and the shoreline, are situated so as to be accessible to the vacuum truck/ duckbill skimmer. Cascading boom displacement, as shown in Figure 4-12, is an alternate method to staggered boom displacement. Two or more booms are deployed at some distance downriver from each other and at a similar angle to the shoreline. The oil is guided into a collecting basin or sump for clean-up by vacuum truck/duckbill skimmer.

4.3.2 Culvert Covers

Manually activated culvert covers, of a slip-type design, are installed on all culverts opening to the man-made wetlands adjacent to the Colorado River. A map indicating the location of these culvert covers is shown in Figure 4-7.



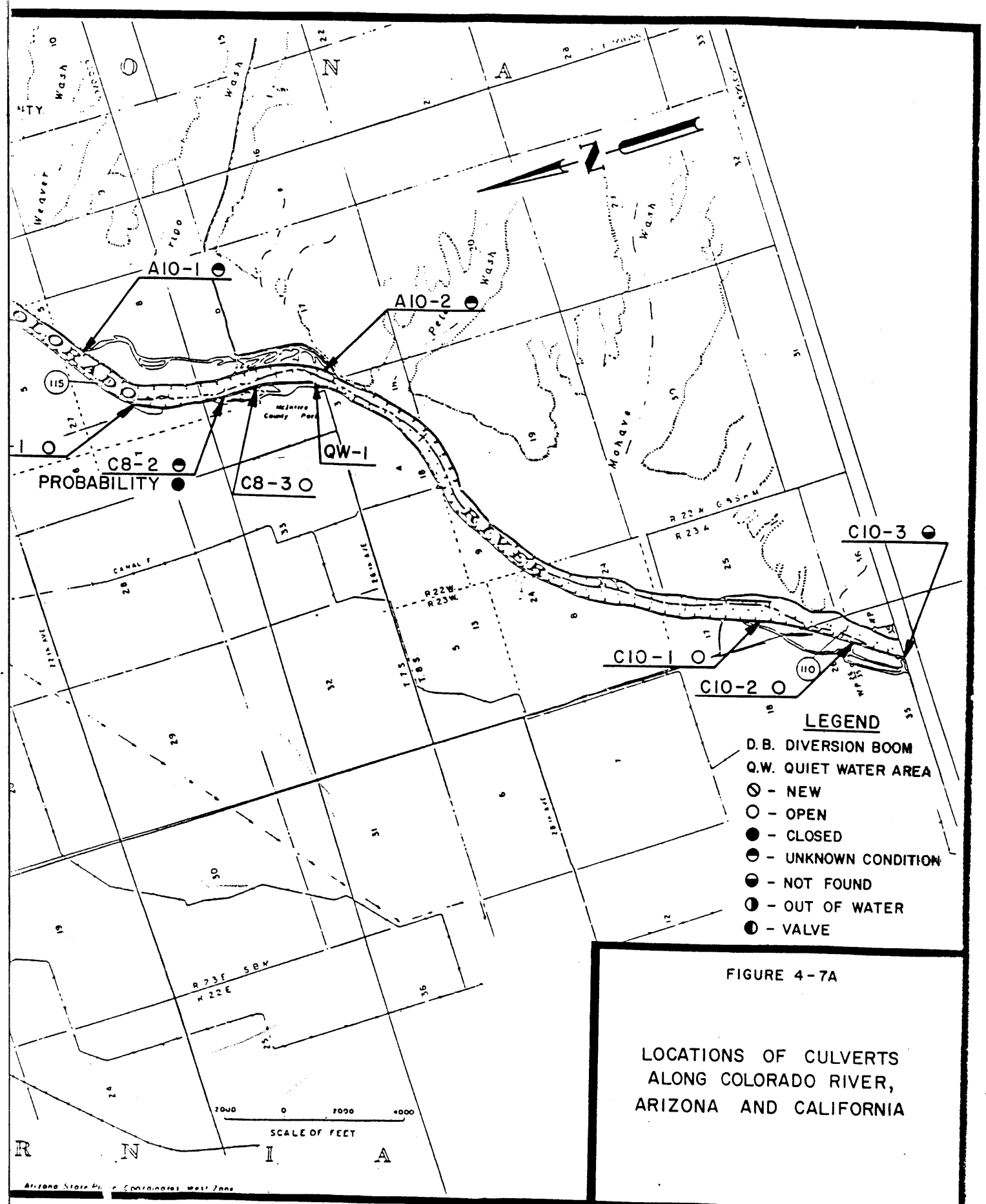
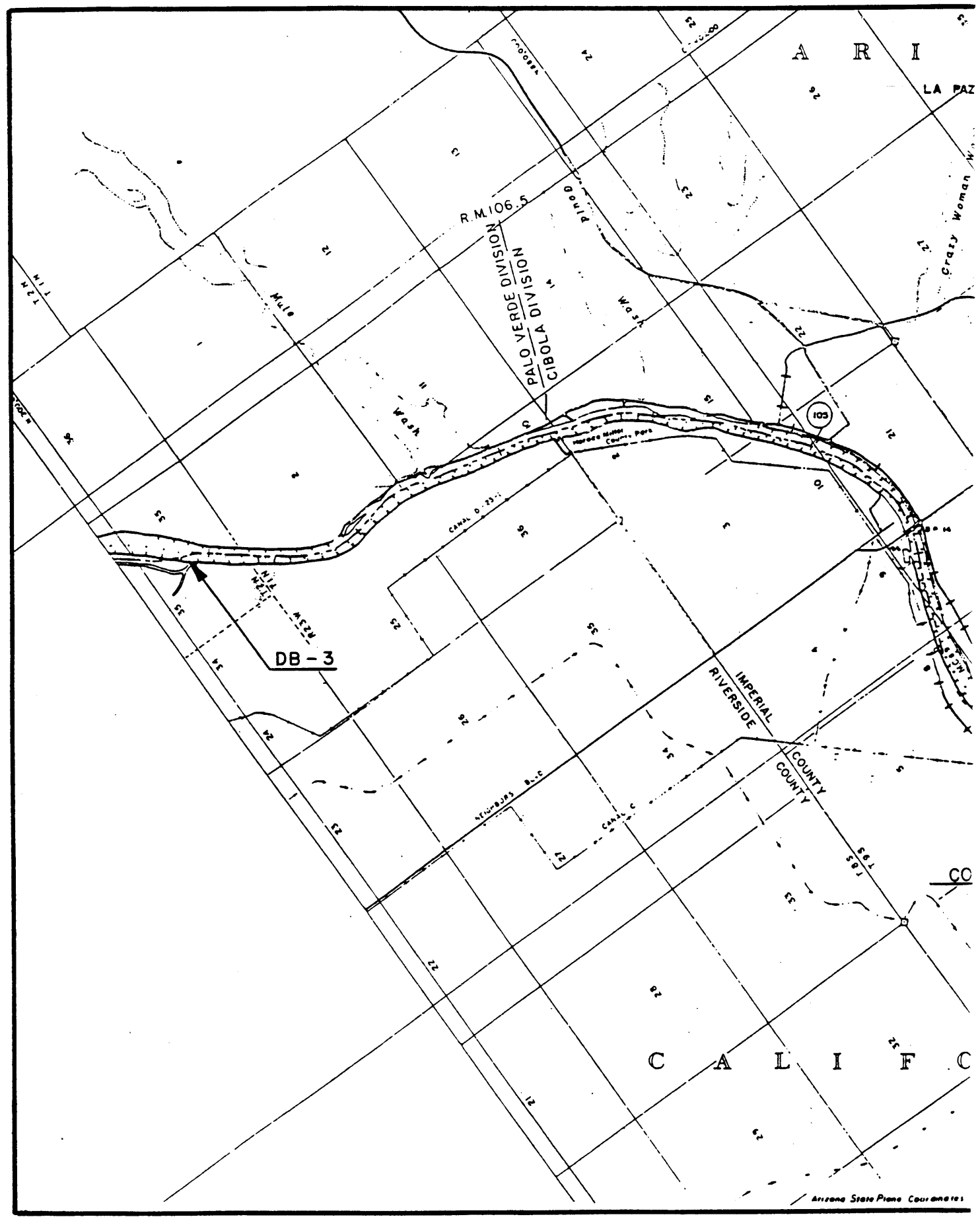


FIGURE 4-7A

LOCATIONS OF CULVERTS ALONG COLORADO RIVER, ARIZONA AND CALIFORNIA



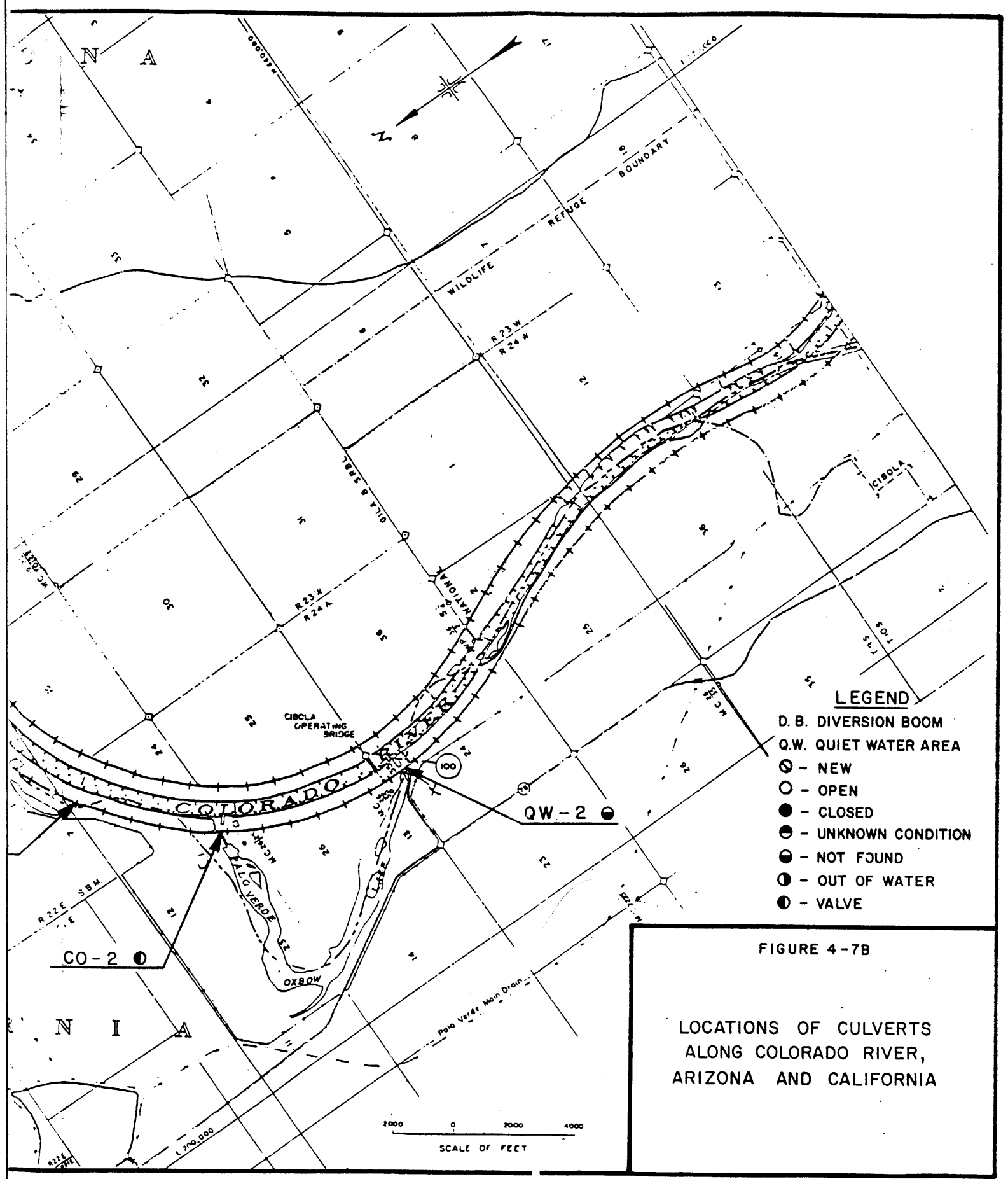
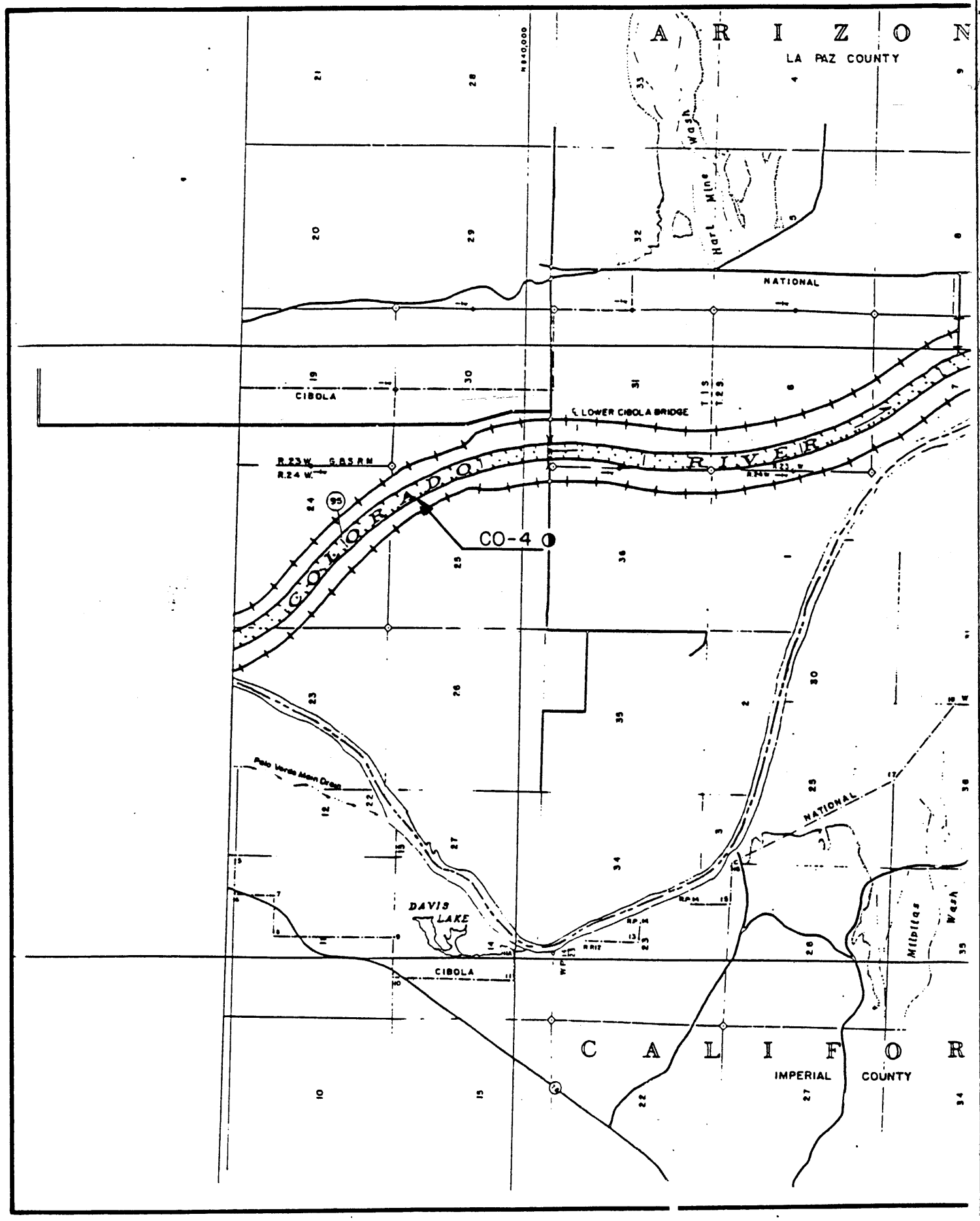
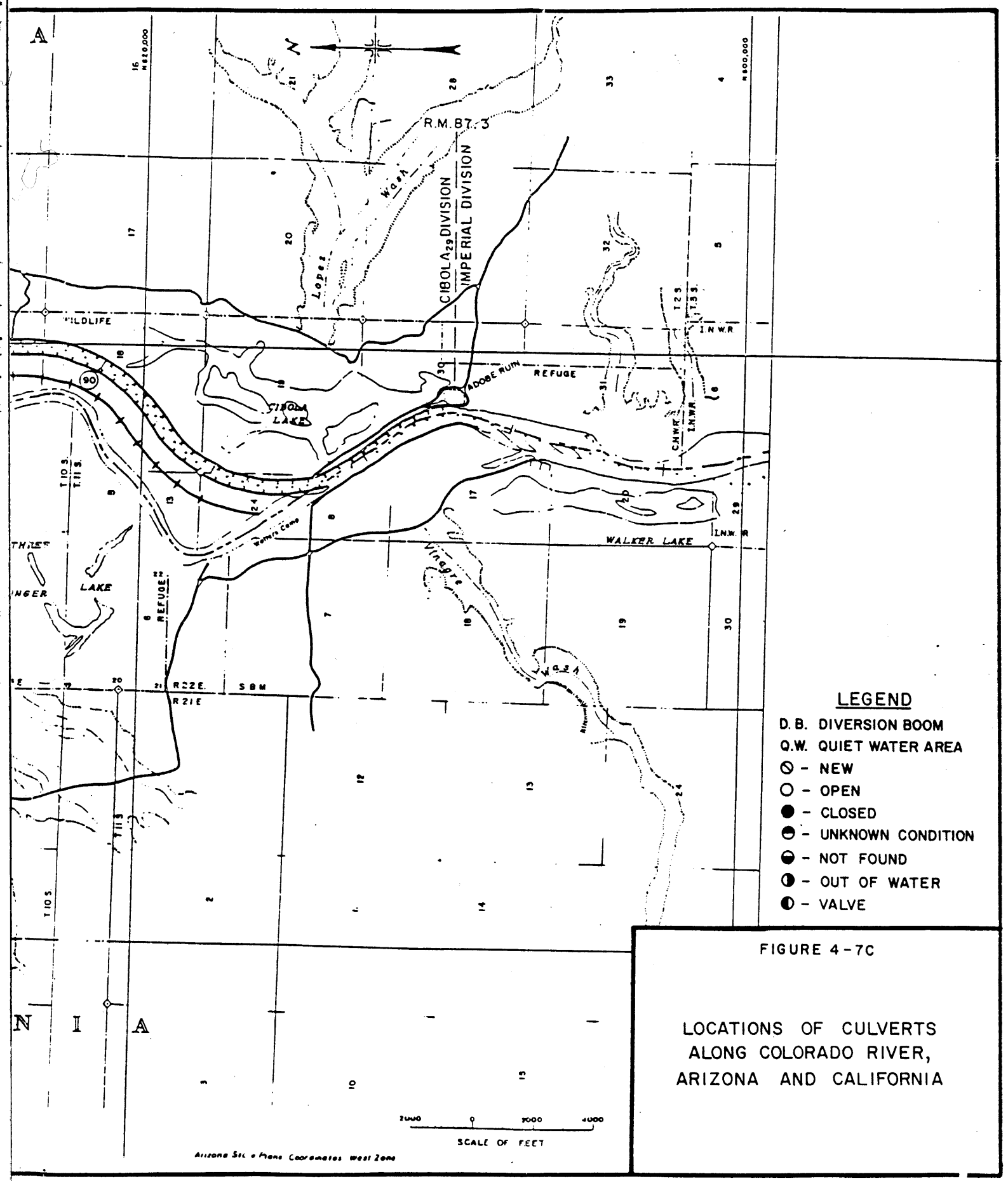


FIGURE 4-7B

LOCATIONS OF CULVERTS ALONG COLORADO RIVER, ARIZONA AND CALIFORNIA





LEGEND

D.B. DIVERSION BOOM
Q.W. QUIET WATER AREA
⊘ - NEW
○ - OPEN
● - CLOSED
◓ - UNKNOWN CONDITION
◒ - NOT FOUND
◑ - OUT OF WATER
◐ - VALVE

FIGURE 4-7C

LOCATIONS OF CULVERTS ALONG COLORADO RIVER, ARIZONA AND CALIFORNIA

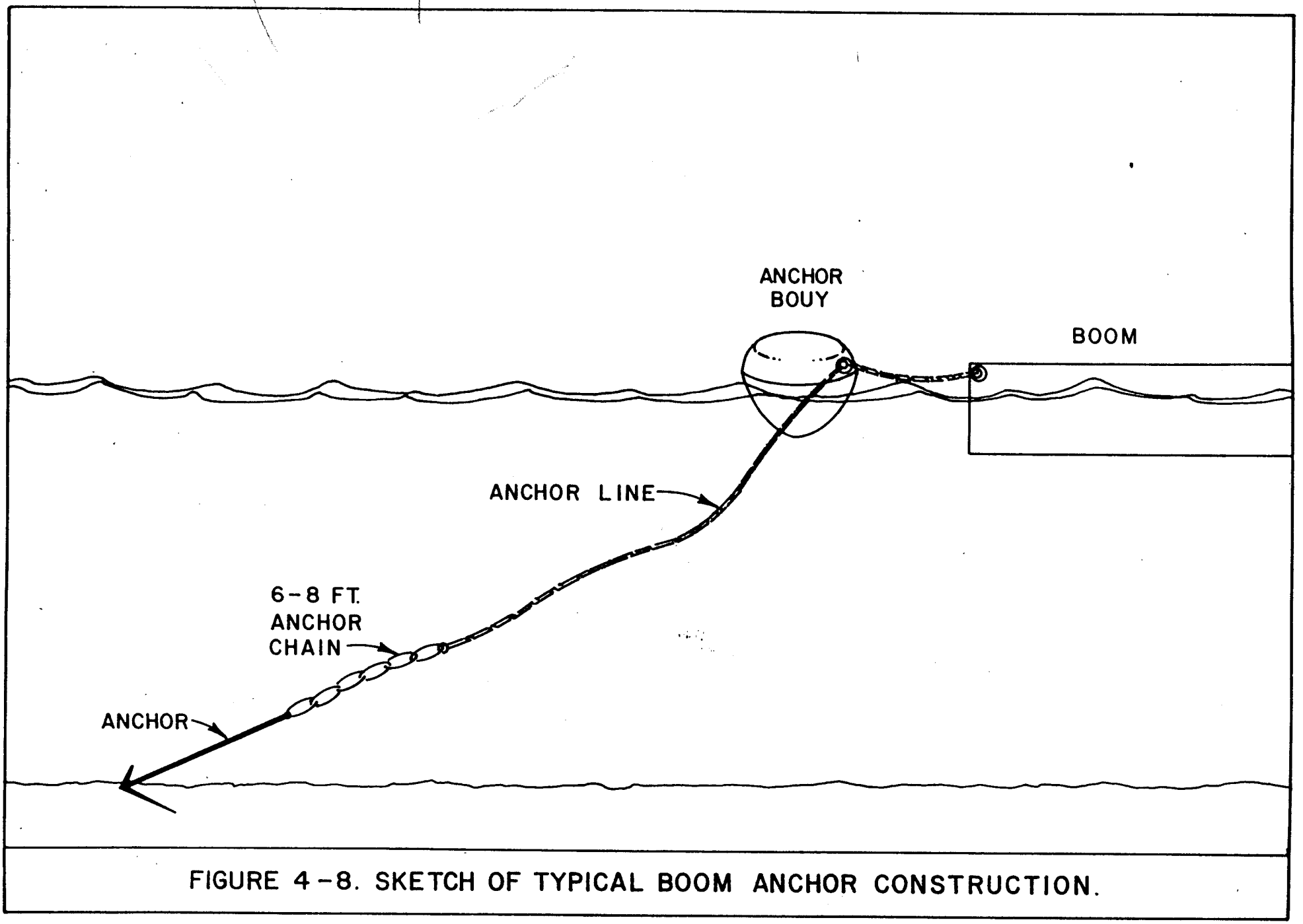


FIGURE 4-8. SKETCH OF TYPICAL BOOM ANCHOR CONSTRUCTION.

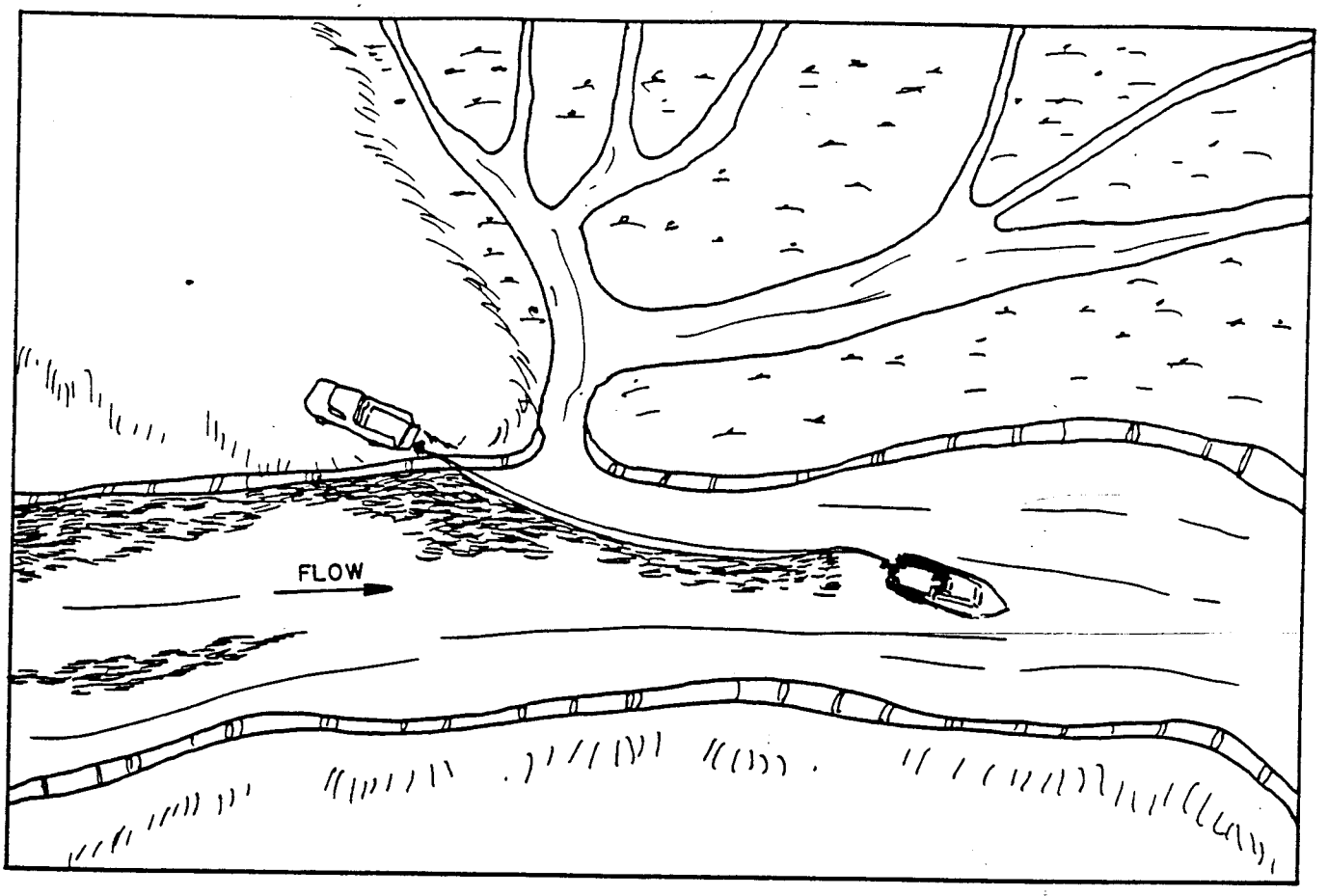


FIGURE 4-9. DEPLOYMENT OF DIVERSION BOOM.

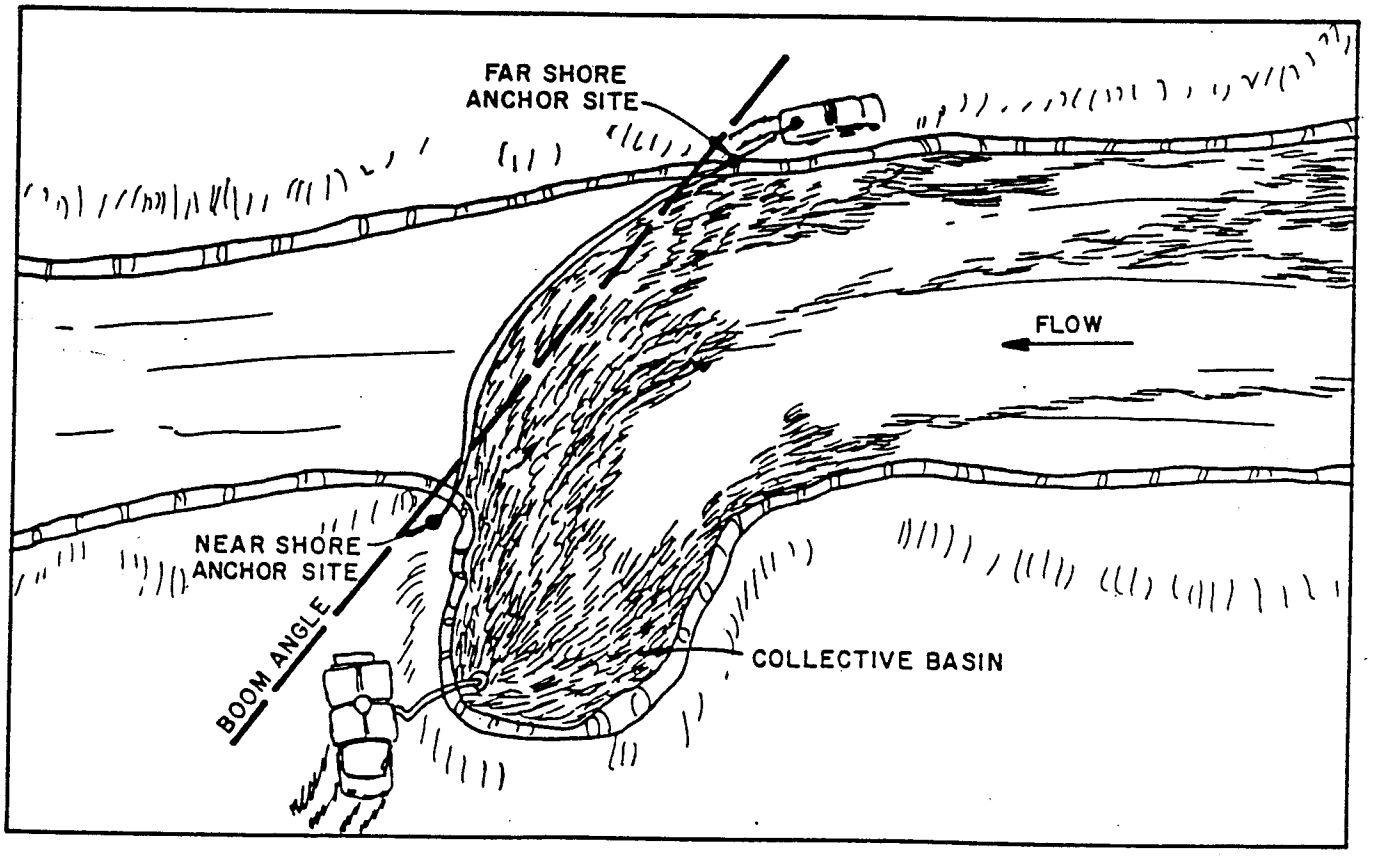


FIGURE 4-10. DEPLOYMENT OF CONTAINMENT BOOM.

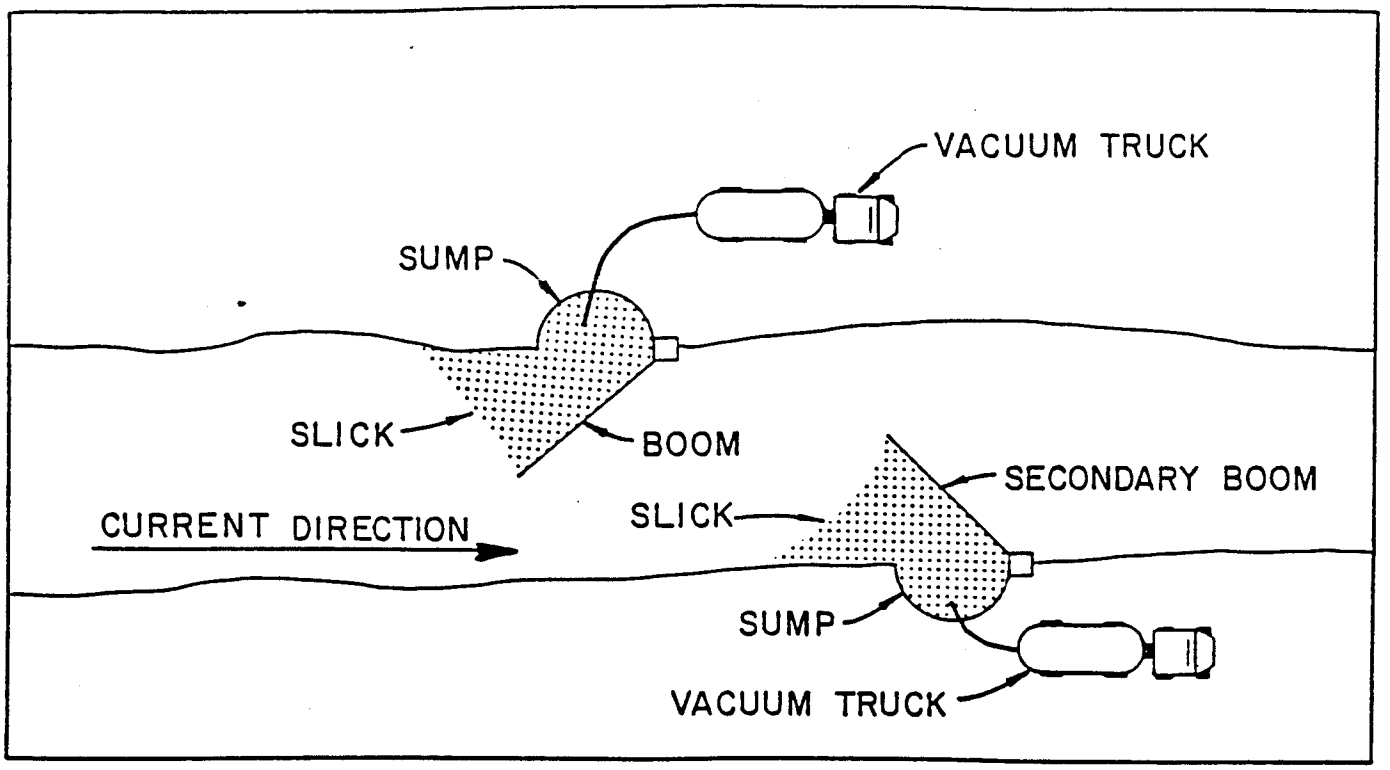


FIGURE 4-11. DEPLOYMENT OF BOOMS IN STAGGERED FORMATION.

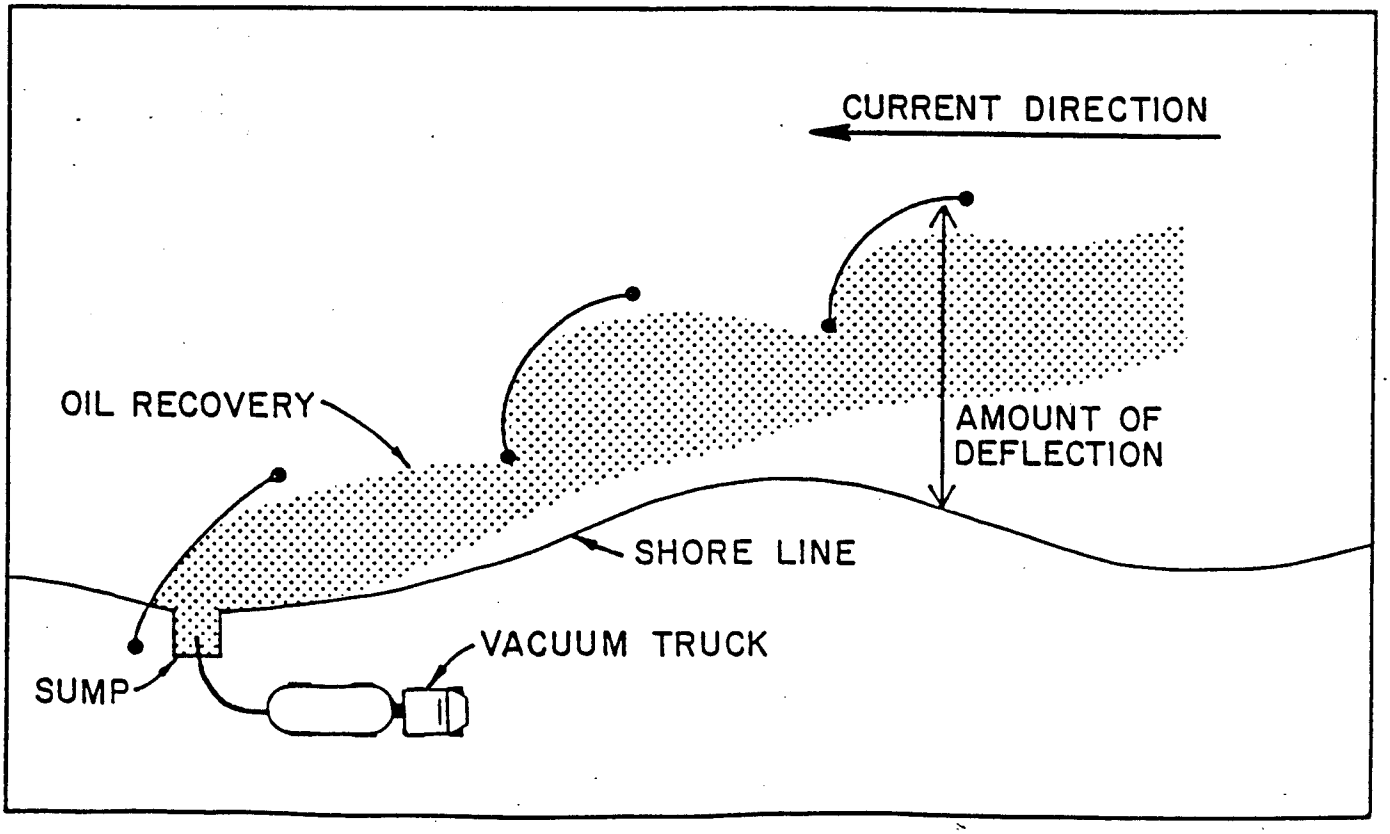


FIGURE 4-12. DEPLOYMENT OF BOOMS IN A CASCADING FORMATION.

In the event of a spill, these covers will be lowered, effectively sealing off the wetlands areas through R.M. 89. The culvert covers are marked with distinctive reflector tape for ease of sighting. Then Mesa District Manager should work with the Bureau of Reclamation to insure that the culvert covers and associated tie-downs are not destroyed during routine river levee maintenance.

4.4 BIRD DISPERSAL

Bird dispersal/deterrence will be conducted by wildlife agency personnel and will be done at their discretion. Bird dispersal is used in situations where the spill is likely to impact waterfowl. The main objective of deterrence is to reduce the numbers of individuals thereby reducing the likelihood of the spill impacting the waterfowl. Various deterrent devices include dyes, searchlights/flashlights, raptors, distress/ alarm calls, predator sounds, AV-alarm, pyrotechniques, gas exploders, aircraft, and lure areas.

5.0 SPILL CLEAN-UP

Clean-up procedures are dependent upon location, size, and accessibility of the oil spill. Terrestrial clean-up methodology includes: natural degradation, hydroblasting/ steam-cleaning, flushing, manual clean-up, sorbent material, and mechanical clean-up. Aquatic clean-up consists primarily of mechanical methods of clean-up.

Sorbent material is stored at the El Paso Natural Gas yard in Blythe, California. Hay is readily available from nearby sources.

5.1 SITE SPECIFIC

Primary clean-up procedures specific to the Colorado River include the use of sorbent materials, hay, skimmer unit/vacuum truck, and mechanical equipment at the two designated quiet water areas. These are discussed later in detail. Natural degradation will be used for levee rocks, if possible. Sorbent material will be used on any scattered oil pockets incountered in the Colorado River.

5.2 TERRESTRIAL SPILL CLEAN-UP

Clean-up methodology for terrestrial spills is largely dependent upon the size of the spill and the terrain. As stated above, methodology includes natural degradation, hydroblasting/steam-cleaning, flushing, manual clean-up, sorbent material and mechanical clean-up.

5.2.1 Natural Degradation

Natural recovery includes treatments which enhance the natural degradation of the crude oil. Limitations of this techn'que include accessibility, traffic, depth of penetration, energy available, utilization of the spill area and environmental sensitivity.

Generally, this method involves break-up of the oil layer or contaminated substrate. This allows increased photochemical oxidation and microbial degradation. It is restricted to non-recreational or low-amenity areas.

The technique used for natural degradation is to disc (to 8 inch depth) or chisel plow (below 8 inch depth) the spill area perpendicular to any sloped areas. Discing or plowing should be done at frequent intervals. Fertilization

can, at times, enhance the action of discing/plowing. Fertilization usually employs the use of a standard (8-8-8) nitrogen, phosphorous and potassium (NPK) fertilizer at an oil to fertilizer rate of 1:10. If an asphaltic layer forms on cobble, sand or gravel areas, a two or three-toothed ripper can be used. Although this measure can be very effective, under most circumstances this is not the preferred method of clean-up.

5.2.2 Hydroblasting/Steam-Cleaning

Hydroblasting/steam-cleaning methodology involves techniques to remove oily layers from rocks, boulders, and man-made structures. Limitations of this methodology include accessibility, availability of freshwater or sand, and applicability of other less environmentally damaging techniques. When properly used, hydroblasting can remove oil from virtually any surface, including living organisms. Basically, it consists of the use of a high-pressure water jet to destroy the oils adhesive properties. Hydroblasting is safest within a boomed area next to a waterline. Use of this technique on live organisms should be done only when a biologist familiar with the local ecosystems is relatively certain that recolonization will occur.

As with hydroblasting, steam-cleaning will remove oil from virtually any surface. However, as steam-cleaning raises the crude temperature (lowering its viscosity), it is not suitable for use with living organisms.

Hydroblasting and steam-cleaning merely move crude from one surface to another. Therefore, caution should be used to insure that the surface the oil is transferred to is easily removed or cleaned. This may include substrates from sand beaches to plastic lining depending upon resources available at the spill area. Cleaning should begin at the highest point and proceed downward to the transfer substrate.

5.2.3 Flushing

Flushing is essentially low pressure hydroblasting and is used primarily to remove non-sticky oil or an unconsolidated substrate. It is limited by accessibility and substrate erosion potential. As with hydroblasting and steam-cleaning, flushing begins at the highest point and ends at the lowest cleaning point. Oil can be recovered by substrate removal, collection on surface waters by berms and/or booms, vacuum trucks, or other method which may be applicable.

5.2.4 Manual Removal

Manual removal of crude is recommended for areas not accessible to mechanized cleaning, in areas of sporadic contamination and as the final effort of clean-up operations. Crude can be removed by hand pumps and/or buckets and contaminated substrate and vegetation by shovel, rakes and pitchforks.

Oily deposits can also be removed by scraping or vine brushing. Contaminated material is loaded into appropriate containers and removed by truck, or other conveyance, to an approved landfill area.

5.2.5 Sorbent Materials

Sorbent materials are used to recover small amounts of crude on both terrestrial and aquatic substrates. It is limited to use with low viscous crude which can be absorbed. It cannot be used in rugged terrain. Sorbent materials are placed directly on to the crude for absorption. Continued use of sorbent material is recommended as long as it is effective. Contaminated sorbents are stored in appropriate containers and transferred to approved landfill sites.

There are various types of sorbent material available for use. Commercial sorbents are typically man-made porous materials similiar to soft styrofoam. Natural sorbents include hay/ straw and recently, chicken-feather "pillows" (Anonymous 1982). A list of sorbent resources is to be maintained at the Mesa District Office.

5.2.6 Mechanized Recovery

Mechanized recovery is used to remove contaminated substrate and is limited to accessibility, environmental sensitivity, substrate type and local approval. It involves the combined use of various earth-moving equipment as well as vacuum trucks, skimmers and pumps. Mechanized removal equipment includes motor grader, motorized elevating scraper, conveyor system, bulldozer/front-end loader, backhoe, utility tractor, vacuum truck and skimmers.

The motor grader is used on sand and gravel or unconsolidated soil where oil penetration does not exceed one inch. They are also used on mud flats, if trafficability permits. Graders cut and remove surface layers of contaminated material forming it into windrows, which elevating scrapers pick-up and haul to unloading areas or approved

disposal sites. The grader blade is set at a 140° angle from the direction of travel and a cut depth equal to the depth of penetration. The windrows are cast parallel along the length of the contaminated area.

Motorized elevating scrapers are used on sand, gravel or unconsolidated soil substrates where oil penetration exceeds one inch or to remove tar balls, oil patties, or debris. The scraper operates parallel to the length of the contaminated area. The cutting blade is set to the depth of oil penetration or a skim cut for oily debris removal. When the hopper is full, the scraper is driven to the unloading area where the collected material is dumped. Front-end loaders can be used in place of motorized elevating scrapers.

The conveyor system is used to transfer contaminated materials from elevating scrapers into dump trucks for disposal. The loader scraper is dumped onto the conveyor system which transfers the contaminated substrate into dump trucks. A vibrating screen attached to the upper end of the conveyor can seperate out clean substrate for return to the spill site.

Bulldozer/front-end loader is used on coarse sand, gravel or rough terrain areas where penetration is deep, contamination extensive and trafficability poor. The bull-dozer is used to push contaminated material into piles for removal by front-end loaders. Cuts should not exceed the depth of oil penetration.

Backhoes are used to remove oil-contaminated sediments on steep banks in area where other pieces of equipment are not practical. The backhoe removes contaminated substrate from downhill to uphill. Collected materials are stockpiled or loaded into conveyance vehicles.

Front-end loaders are used to load stock-piled materials into conveyance vehicles and to clean-up debris or patchy areas. They may be either rubber-tired or tracked and are usually fitted with buckets ranging from 3/4 to 10 cubic yards.

Vacuum trucks are positioned to remove crude by suction from concentrations behind booms, berms, trenches, etc. The hose is continually repositioned so that the suction head is in contact with the crude. Duckbill-type skimmer heads should be fitted to the suction hose for aquatic spills or screens for terrestrial spills. Pumped oil can be stored in approved containers or removed directly 'o approved disposal sites.

5.3 AQUATIC SPILL CLEAN-UP

Clean-up procedures for freshwater spills are limited to sorbent materials and mechanical removal. The use of sorbents is discussed in Section 5.1. Mechanical removal includes the use of vacuum trucks and portable skimmers. Vacuum truck technique is also discussed in Section 5.1.

Portable skimmers used in shallow water may require a deepening of the channel to accomodate the skimmer. The oil is contained directly or by forcing the crude into the skimmer with low-pressure water-flushing. A boom may also be erected around the spill and used to force the oil to the skimmer by reducing the boom's perimeter.

5.4 OILED WATERFOWL CLEAN-UP

The clean-up and rehabilitation of oiled waterfowl is a critical part of this plan given the endangered status of the Yuma clapper rail and concern for the black rail. Technical and physical expertise is available from the International Bird Rescue Center (I.B.R.C.) located in Berkeley, California (415/841-9086) and California Fish and Game. Technical information is also available from the Patuxent Wildlife Research Center, Laurel, Maryland (301/498-0300) and the U.S. Fish and Wildlife Service, Washington, D.C. Oiled waterfowl treatment, consists of capture, clean-up, rehabilitation, and release. A copy of API-4407, "Rehabilitating Oiled Seabirds: A Field Manual," is located at the Bakersfield District Office. Clean-up and rehabilitation facilities which may be available in the Blythe area depending upon season and availability include the following:

1) Fairgrounds livestock facilities;
2) Animal shelter (both County and Local);
3) R. J. Ranft Warehouse;
4) Palo Verde Unified School District bus barn; and,
5) Local vacant real estate (I.E. stores, houses, etc.) which can be identified by contacting local realtors.

5.5 WASTE DISPOSAL

After crude contaminated substances have been collected, they must be disposed of in EPA and/or state approved hazardous waste disposal sites. Table 5-1 lists approved hazardous waste disposal sites.

TABLE 5-1
WASTE DISPOSAL FACILITIES

CA	CASMALIA DISPOSAL COMPANY 539 San Ysidro Road Santa Barbara, CA 93108 ATTN: James McBride	805/969-5897
CA	ENVIRONMENTAL PROTECTION CORPORATION - EASTSIDE 3040 19th Street, Suite 10 Bakersfield, CA 93301 ATTN: Bill Park	805/327-9681
CA	ENVIRONMENTAL PROTECTION CORPORATION - WESTSIDE 3040 19th Street, Suite 10 Bakersfield, CA 93301 ATTN: Bill Park	805/327-9681
CA	IT CORPORATION 336 West Anaheim Wilmington, CA 90744	213/830-1781

6.0 REPARATION

The final action in a spill response is returning the land surface to as near its original state as is feasible. This includes correcting changes in topography as well as revegetation of the disturbed surface. The Operator will replace/return wildlife resources adversely impacted by a spill by the Operator's line based upon discussions with Federal and State wildlife agencies.

6.1 TOPOGRAPHY

Repairs to topography include replacing contaminated soils and contouring. All soils which were removed because of contamination by crude should be replaced with clean fill of similar physical characteristics. This fill is usually available commercially.

After contaminated soils are replaced with clean fill, the surface is returned to its original contour, using bull-dozers and/or motor graders. If no surface preparations are required for revegetation, the surface should be smoothed. Otherwise, the surface preparations for revegetation should be completed at this stage.

6.2 REVEGETATION

Revegetation efforts will require consultation with Federal and State wildlife personnel given the rapidity with which revegetation techniques are updated and/or changed. The most critical areas for revegetation are the wetlands adjacent to the Colorado River. Castle (1977) noted that crude oil accumulation typically occurs in the outer 1m to 2m zone (3' to 6') for emergent forms of vegetation. He further states that

> "within these fringe areas, contamination is usually limited to the surface of the substrate and plant stalks... Photosynthetic portions of the plant extending above the high-tide [water] level usually are not oil contaminated. Plants partially contaminated by residual and low toxicity oils can be expected to recover" (Castle 1977).

Even in cases where contamination of emergent vegetation occurs, it is possible for recovery to occur by removing the contaminated portions of the plants provided the integrity of the root system is maintained and that substrate contamination is not significant.

If the clean-up methodologies applied (flushing, manual removal, sorbents, etc.) are not entirely effective, removal of contaminated plant material by cutting is suggested. Castle (1977) warns that extreme care should be taken to prevent or minimize damage to the root systems. He suggests that "mechanical weed-harvesting devices... be used for cutting marsh fringes" (Castle 1977).

7.0 SPILL DOCUMENTATION

Spill documentation is based upon land ownership, size and whether or not it involves navigable waters. The following describes documentation for terrestrial and aquatic spills. Spill documentation is vital as it provides a historical account of the spill, provides data necessary to prevent future spills, and provides a detailed legal instrument for the protection of the company.

7.1 TERRESTRIAL SPILL DOCUMENTATION

Terrestrial spills will be documented by using the form shown in Figure 7-1 and preparation of a narrative report will minimally include:

1. Time and date of discharge;
2. Location of discharge (including location map);
   a) County
   b) Township
   c) Range
   d) Parcel Identification Number
3. Land Owner;
4. Type of product spilled;
5. Amount of product spilled;
6. Detailed description of cause for leak/rupture;
7. Detailed description of damages (including sketch maps);
   a) Property
   b) Environment
8. Detailed description of remedial actions;
9. Federal, state and/or local agencies and/or personnel contacted;
10. Copy of "Pipeline Leak Report";
11. Any other product information.

If the spill involves more than 50 bbl, the form shown in Figure 7-2 will be completed. Copies of all forms and the narrative report will be submitted to pertinent Federal, state and/or local agency representatives depending upon the nature and size of the spill.

A photographic record of the spill will be initiated as soon after the spill as possible. The photographic record may include:

1. Polaroid photographs;
2. Color/black and white photographs;

FIGURE 7-1. SAMPLE FORM FOR REPORTING PIPELINE LEAKS/RUPTURES

PIPELINE LEAK REPORT

DATE: _____ 19___

LINE OR FACILITY _____

LOCATION OF LEAK: SEC. _____ TOWNSHIP _____ RANGE _____
COUNTY _____ TRACT NO. _____

DISTANCE TO NEAREST LANDMARK (Highway, Public Building, Pump Station, M.P. Marker, etc.)

_____

_____

LAND USE: Barren ___ Agriculture ___ Urban ___ Waterway ___ Other ___

DISTANCE TO NEAREST LINE MARKER _____ PATROL FREQUENCY _____
DATE OF LEAK OCCURRENCE _____ TIME OF LEAK _____ A.M. P.M.
REPORTED BY _____ DATE _____

DESCRIPTION AND CAUSE OF LEAK _____

_____

TYPE AND CONDITION OF COATING _____ LINE COVER _____

REPAIRS MADE BY _____

HOW REPAIRED _____

OIL LOST: TYPE _____ TOTAL SPILL * _____ bbls
RECOVERED _____ bbls

LINE SHUT DOWN FROM _____ TO _____ HOURS _____

DAMAGES _____

ESTIMATED COST OF CLEAN UP $_____ EST. PROPERTY DAMAGE $_____

ESTIMATED COST OF REPAIR $_____

SPILL REACH NAVIGABLE WATERS _____ NO _____ YES (Complete Navigable Water Spill Report)

AGENCY	CONTACTS YOU HAVE MADE DATE AND TIME CALLED	NAME OF PERSON TALKED TO
___ LANDOWNER		
___ U.S. COAST GUARD		
___ DEPT. FISH & GAME		
___ E.P.A.		
___ DIV. OF OIL & GAS		
___ EMERGENCY SERVICE		
___ OTHER		

SUBMITTED BY: _____

* OVER 50 bbls, complete Major Oil Spill Report Form

FIGURE 7-2. SAMPLE FORM FOR REPORTING MAJOR OIL SPILLS

MAJOR OIL SPILL REPORT
(over 50 bbls)

COMPANY PROPERTY DAMAGE: DESCRIPTION _____
_____ COST $_____

OTHERS PROPERTY DAMAGE: DESCRIPTION _____
_____ COST $_____

CONFIGURATION AT POINT OF LEAK: STRAIGHT ___ OVERBEND ___ UNDERBEND ___

DETAILED DESCRIPTION OF LEAK (ADDITIONAL PAPER MAY BE USED, IF NECESSARY)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

NUMBER OF PERSONS INJURED COMPANY _____ OTHERS _____
NUMBER OF PERSONS KILLED COMPANY _____ OTHERS _____

PIPELINE DATA

NOMINAL DIAMETER _____ (INCHES) WALL THICKNESS _____ (INCHES) GRADE ____

YEAR OF INSTALLATION _____ TYPE JOINT _____

DESIGN PRESSURE _____ PSI PRESSURE AT LOCATION OF LEAK _____ PSI

TESTING MEDIUM _____ DURATION OF TEST _____

FREQUENCY OF TESTS _____ TYPE OF TEST USED _____

3. 35 mm color slides;
4. 8 mm color movies;
5. VCR cassette movies.

Each photographic record will be labeled by location, date, time and photographer's name.

A log will be developed to record every spill, whether minor or major. Figure 7-3 illustrates an example of what a page in the log may look like. Use of the log will provide a clear record of conversations pertaining to the spill.

7.2 AQUATIC SPILL DOCUMENTATION

Aquatic spill documentation will include, at a minimum, the documents and photographic record generated for terrestrial spills. Additionally, detailed climatologic and hydrologic information will be prepared. Climatologic documentation will minimally contain data regarding temperature, precipitation, humidity, wind speed and direction, sky conditions, and other pertinent information. Hydrologic data documented will include condition of waterway, depth of waterway, description of current speed, description of oil slick (including depth, color, etc.) and other pertinent information. The climatologic and hydrologic data will be incorporated into the narrative report. All data and reports generated will be sent to the appropriate regulatory agency personnel.

7.3 STATE REPORTING PROCEDURE

The state of California has three formal spill report forms: OES notification/reporting form; California Resources Agency pollution investigation report; and report of fish and wildlife loss. These are shown in Figures 7-4 through 7-6.

FIGURE 7-3

OIL SPILL NOTIFICATION LOG

Name/Position of Person Making Calls: ______________________________

DATE	TIME	AGENCY NOTIFIED	PERSON CONTACTED/ POSITION	CALL SUMMARY

FIGURE 7-4

OES NOTIFICATION/REPORTING FORM

STATE OF CALIFORNIA — HAZARDOUS SUBSTANCE SPILL REPORT

NOTIFIED OES _____ PHONE _____ DTG _____

REPORTED BY _____ PHONE _____

COASTAL _____ INLAND _____ WATER INVOLVED _____ COUNTY _____

SUBSTANCE(S) _____ QUANTITY _____

SHIP _____ OIL FIELD _____ PIPELINE _____ FREEWAY/ROAD _____ RAILROAD _____ PLANT _____

SHIP/ROAD/INSTALLATION _____

LOCATION _____

WHAT HAPPENED _____

LCL AGENCIES ON SCENE/NOTIFIED: FIRE DEPT ___ SHERIFF ___ POLICE ___ DOH ___ F&A ___ CO OES ___

LCL AGENCY INVOLVEMENT/CONTACTS _____

INJURIES _____

WATER INVOLVED (NAME OF STREAM, ETC) _____

CONTAINMENT _____

CLEAN UP BY/ACTION _____

WEATHER FACTOR _____

REPORT RECEIVED BY _____ ORGANIZATION _____

NOTIFIED:		NAME	TIME	NOTIFIED:		NAME	TIME
F&G	___			CDF	___		
RWQCB	___			DPR	___		
EPA	___			USCG	___		
CHP	___			FEMA 9	___		
DOH	___			LAFC DIST	___		
F&A	___			C C OES	___		
CALTRANS	___			E BAY PK	___		
DWR	___			SFFD	___		
DOG	___				___		
LANDS	___			_____	___		
CAL OSHA	___			_____	___		
FIRE MSHL	___			_____	___		
COUNTY CONTACT:		AGENCY _____		_____	___		
				NAME _____			TIME

FIGURE 7-5

Resources Agency of California
POLLUTION INVESTIGATION REPORT
OIL OR HAZARDOUS MATERIAL SPILL

Filed	Court
Docket#	Cite#
Arraign. Date	Date Paid
Plea	Fine
Other Action	Judge

A. RESPONSIBLE PARTY	PHONE		YES	NO
Name:	( )	Corporation		
Address:	( )	Partnership		
Location:	( )	Proprietorship		

Owner/President/Captain Name:	Home Address:	Years Experience:
Drivers License: State	Number DOB Ht.	Hair Eyes
Chief Engineer/Facility Mgr Name	Home Address:	Years Experience:
Drivers License: State	Number DOB Ht.	Hair Eyes
Duty Mate/Foreman Operator Name:	Home Address:	Years Experience
Drivers License: State	Number DOB Ht.	Hair Eyes
Owner:	Address:	Phone: ( )
Agent:	Address:	Phone: ( )

B. SPILL INFORMATION

Location of Spill/Discharge Address:	Distance to water:	Date/Time of Spill:
Pollutant: (Exact Spelling)	Amount:	Cause:
Reporting Party:	Address:	Phone: ( )
Clean-Up Service Employed:	Date/Time Called:	By Whom:
Supervisor/Foreman of Contractor:		Phone: ( )
Person/Agency Responsible for Clean-Up	Method of Clean-Up	Evaluation of Clean-Up Adequate: ____ Not Adequate: ____

C. NOTIFICATION - RESPONSE - ARRIVAL

Date: ____ Time: ____	Date: ____ Time: ____	Date: ____ Time: ____	Dept./Reg. Personnel Notified: Date: Time:
RWQCB(person):	Date: ____ Time: ____	Date: ____ Time: ____	Office of Emergency Services Person Called: ____ Phone: 800-852-7550 Date: Time:
Other Agency:	Date: ____ Time: ____		Chem. Trec. Phone: 800-424-9300

D. INITIAL BIOLOGICAL ASSESSMENT (Types, Numbers, Extent of Impact, etc.) Remarks

Wildlife:

Aquatic Life:

Vegetation:

E. WEATHER CONDITIONS

1. Temperature: Air Water
2. Wind: Speed Direction
3. Clear ☐ Cloudy ☐ Fog ☐ Rain ☐

F. WATER CONDITIONS

1. Body of Water: County:
2. Current/Tide: Velocity:
3. Are there downstream water users? Yes ☐ No ☐
4. What are they?
5. Have downstream users been notified: Yes ☐ No ☐

G. FEDERAL/STATE FUNDS REQUESTED FOR CLEAN-UP

Has a source for pollutant been located? Yes No

Source: Owner/Responsible Address Bus. Phone ( ) Hm. Phone ( )

Location (Physical Address - Not a Post Office Box)

The owner/responsible has been advised of the necessity of clean-up, and if clean-up is not initiated by owner/responsible, a State/Federal clean-up will be started Yes __ No __

H. EVIDENCE / SAMPLES

1. Outfall: Yes ___ No ___ Color ___ Vol. ___
2. Downstream: Yes ___ No ___ Color ___ Vol. ___
3. Upstream: Yes ___ No ___ Color ___ Vol. ___
4. Other: (Specify) _____

PHOTOS Yes ___ No ___

Type Film: _____
No. of Photos: _____
Date Taken: _____
Taken by: _____

DIAGRAM Yes ___ No ___

I. WITNESSES:

Name(s)	Address(s)	Phone Number(s)
1.		( )
2.		( )
3.		( )

J. DISTRIBUTION OF REPORT

Regional Office ____ Date: _____
District Attorney ____ Date: _____
Attorney General ____ Date: _____

Other Agencies: _____

K. SUMMARY OF EVENTS (Use Additional Pages When Needed)

INVESTIGATOR: _____ (Print) DATE OF REPORT: _____

SIGNATURE: _____

FIGURE 7-6
INITIAL REPORT OF FISH AND WILDLIFE LOSS

CAUSE: DISEASE ☐ PESTICIDES ☐ POLLUTION ☐ OTHERS OR UNKNOWN ☐

LOSS: FISH ☐ BIRDS ☐ MAMMALS ☐

IN: WILD POPULATIONS ☐ INSTALLATION ☐

Fish and Game Region_____ County_____ Specific Location_____

Date of First Loss_____

Loss First Reported By_____ On_____
Name Address Date

LOSS DUE TO:

☐ PESTICIDES: (Describe type, rate and purpose of application, size of area treated)

☐ POLLUTION: (Describe type, source, color, odor, etc.)

☐ DISEASE: (Name if known, or symptoms)

☐ UNKNOWN: (Describe circumstances of loss)

ANIMAL KILL INFORMATION: (List species and size range. Put estimated number/species in appropriate box)

Species Killed	Size	Numbers					
		1-50	51-100	101-500	501-1000	1000+	10,000+

EVIDENCE OBTAINED: (to whom did you deliver the samples)

☐ Waste sample (Pollutant) _____

☐ Water samples _____

☐ Animal samples (fish, birds, mammals) _____

☐ Other (describe) _____

Name and address of person or firm believed responsible:_____

Name and address of additional witnesses:_____

(Date of observation) (Submission of report) (Name of reporter

FOR REGIONAL OFFICE USE

Other agencies contacted:_____

Do you plan additional investigations on this loss?_____ Comments:_____

Date:_____ Regional Manager:_____

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A. Field Man Reporting Loss:

1. In instances of significant losses, immediate verbal report will be made to Regional Manager.

2. Field man will complete and mail FG Form #406, "Initial Report of Wildlife Loss," to regional office. Report should be mailed the same day as loss is observed. Fill in as much information as is available, but do not hold up report for lack of information.

B. Regional Manager:

1. Immediate decision and arrangements for special technical assistance, will be made by Regional Manager (any samples submitted to the field station for pesticide analyses must be accompanied by copy of "Initial Report of Fish and Wildlife Loss").

2. Regional Manager will make immediate verbal report of any major loss to the Deputy Director and will be requested to provide the following: Date, location, species and numbers affected, suspected cause, samples collected, disposition of samples, departmental personnel involved, and sources of additional information. Report of minor fish or wildlife loss should be made directly to the Field Station on Form FG 406.

3. In cases of suspected pesticide poisoning, Regional Manager will immediately call Agricultural Commissioner of County in which loss occurred to provide for initiation of joint investigation.

4. In all cases (including pesticides) where loss is due to pollution of surface waters, Regional Manager will call Regional Water Pollution Control Board.

5. Upon receipt of the "Initial Report of Wildlife Loss" from the field man, the region will prepare and forward four typed copies of the report (FG Form #406) to the Deputy Director. In cases of suspected pesticide poisoning, a copy will be sent immediately to the Department of Agriculture, Sacramento, Attn: Field Crops and Agricultural Chemicals. In all cases where loss is due to pollution or surface waters, copy of report form will also be sent to Regional Water Pollution Control Board.

6. Follow-up reports, when appropriate, will be transmitted from the Regional Office to Headquarters, and from Regional Office to field personnel who reported original loss.

7. Regional monthly report will include summary of losses during the month, and will summarize: (a) status of prior cases still under investigation and (b) prior cases on which further action was terminated during the month.

C. Headquarters:

1. Upon receipt of verbal report from Regional Manager, Deputy Director will transmit initial message to the Branch Chiefs and the Conservation Education Officer.

2. In cases of suspected pesticide poisoning, the Pesticide Coordinator will phone State Department of Agriculture for verification of joint action, and will mail copy of completed FG Form #406 to State Department of Public Health and the University of California.

8.0 PUBLIC RELATIONS

In the event of a spill, all media contact will be through the home office. No press or news releases will be issued from the district office. If you are questioned by a media representative, politely explain that you have no authority to respond to his questions and to please contact the home office. Also, if the media representative persists in his inquiries, notify the district manager or other in-field management personnel and request assistance. Obtain the media representative's name and affiliation. Report any media contacts at the earliest convenient opportunity to in-field management personnel. Remember, under no circumstances are you to answer media questions.

If you are approached by a government agency representative, courteously refer him to appropriate in-field management personnel. As with media representatives, do not respond to questioning unless told to do so by the district manager or his representative. In-field and district office management personnel should not sign any waivers proffered by agency personnel unless instructed to do so by company legal staff. If management personnel are approached and questioned by agency representatives and are not responsible or authorized to respond, refer the representative to the appropriate person. Answer all question in a courteous manner. Management personnel should obtain the name of the representative and his agency during any questioning. Management personnel should not argue or speculate during these discussions.

If a citation is issued, the District Manager or other appropriate management personnel will courteously accept it. No unauthorized person will accept any written articles from government officials. If you are not authorized to receive such documentation, refer the government official to the District Manager or other on-site management personnel. When accepting written documents from government officials, record the following:

1. Name;
2. Date;
3. Time;
4. Discussion of the charge;
5. Description of location;
6. Estimated size of spill;

7. Damaged equipment;
8. Spill potential;
9. Changes in clean-up and maintenance prior to the spill;
10. Changes in clean-up and maintenance after the spill; and,
11. Any photographs.

Authorized persons should not sign any document which waives their right to silence and protection from self-incrimination. Discussions should be based on fact, not on speculation.

9.0 TRAINING

9.1 REQUIREMENTS

All Emergency Response Team (ERT) members shall receive training in the operation, maintenance, and deployment of the containment/clean-up equipment applicable to their function. Any alternates will also be scheduled to receive spill training. Drills and training exercises, conducted a minimum of every 15 months, will include full deployment of all on-site containment and clean-up equipment. Personnel will develop maximum familiarity with all aspects of the Oil Spill Contingency Plan, particularly with the immediate response procedures.

The Training Coordinator is responsible for the organization of a periodic training program for all personnel in the ERT. The objectives of this training program are:

1) To maintain the plan as a fully operable working document;
2) To inform team members of their respective duties and of standard communication procedures;
3) To familiarize team members with the use of all equipment;
4) To update the plan so that it includes all new equipment and procedures; and
5) To modify the plan on the basis of information gained from field exercises.

The training program will include field demonstrations and tests of new equipment and procedures and drills to test immediate response actions. Full-scale field demonstrations will be held to train and instruct all personnel in the use of their respective equipment. Arrangements will be made with oil spill cooperatives and/or appropriate State/Federal agencies to conduct field demonstrations, and equipment manufacturer representative will be consulted as necessary during the initial phase of the demonstrations. Field exercises will include demonstrations of the deployment, operation, recovery, and maintenance of all equipment.

Oil spill response drills will provide the ERT with practical experience in response operations and will help to maintain the Contingency Plan as a working document. The drills will include response actions (such as notification, immediate response actions, assessment, containment, exclusion, cleanup, and documentation) called for by the hypothetical spill.

The necessary spill equipment may be deployed periodically so that personnel can develop the operational skill required for their efficient mobilization.

Following all field exercises, a meeting will be held in which the Contingency Plan will be discussed and evaluated in light of the training drill, and the plan and training program will be modified accordingly. The training coordinator or his designate will conduct the critique, prepare a report describing the results of the drill, and suggest changes in the contingency organization and plan, if necessary.

9.2 REFERENCE PUBLICATIONS

The training coordinator will receive from the Environmental Protection Agency, American Petroleum Institute, and United States Coast Guard published reports and training films related to ongoing and completed oil spill research projects. He may also attend conferences at which oil spill technology is discussed.

9.3 OIL SPILL CONTINGENCY PLAN

All key personnel for small and large spill operations will receive a copy of the "Oil Spill Contingency Plan." Each will be required to submit to the District manager, a signed statement that the plan as related to his/her responsibilities is fully understood.

9.4 INTERACTIVE TRAINING

At various times, local emergency personnel (Police, Fire, and Sheriff's Departments) and State/Federal agency personnel will be invited to attend training sessions. This will enable localized response in the unlikely event that AAPL personnel are unable to immediately respond to a spill.

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APPENDIX A
CLEANING TECHNIQUE FOR WATERFOWL AND SMALL MAMMALS

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CAPTURE

The initial step in waterfowl clean-up/rehabilitation is the capture of oiled birds. Capture of oiled birds will be conducted by trained individuals of the involved fish and game agencies. Williams (1977) presented a detailed discussion of oiled bird rehabilitation. In this discussion, the state of most captured oiled individuals is usually "somewhat debilitated by oil toxicity, exposure, or starvation." Birds not in this condition are most likely healthy enough to escape capture.

At the time of capture the birds are given an initial treatment which includes, according to Williams (1977):

1. The removal of oil from the nostrils and mouth so that no further oil is injested and breathing is unhampered.

2. Tube-feeding birds with a warm solution of 2 to 5 per cent glucose in fresh water to provide hydration and an easily utilized source of energy.

3. Wrapping the birds' bodies in cloth and taping their beaks shut to prevent further preening and ingestion of oil.

4. Placing the birds in a quiet, sheltered area in individual boxes to await transport.

After capture, the birds are transported to the designated treatment center.

CLEAN-UP

Clean-up is conducted at the rehabilitation center. According to Putman (1977), the centers should be located at secured areas to prevent distrubance by well-meaning and/or curious on-lookers. They need sufficient running water and electrical outlets. And finally, they must be available for the length of time needed to rehabilitate the waterfowl.

Upon arrival at the rehabilitation center, documentation begins. The birds are identified as to species, if possible, banded, weighed, sexed, and aged. Other supporting information, such as capture site, degree of oiling, and prior treatment are also recorded. After this, the bird's temperature is taken. Normal temperature for avifauna is 39°C (103°F). If the individual's temperature is significantly lower, it is placed under a heating device, such as a heat lamp, until it's temperature returns to normal. If birds are actively preening, they are wrapped in clean cloth to prevent further ingestion of oil. This is done only if does not further aggravate the individual thereby raising the metabolic rate and using energy reserves. If a bird is beyond rehabilitation, as determined at this time, it is to be euthanized (Williams 1977). Putman (1977) stated that most euthanasia agents were secondary poisons which required that the carcasses be properly disposed of, i.e. burning. According to Williams (1977), birds requiring euthanasia exhibit

> "obvious signs of distress, such as convulsions, extreme lethargy, or labored breathing accompanied with gasping or gurgling sounds; those with traumatic injury, such as fractured limbs or lacerations; and those whose body temperature remains low despite supplemental heat and the warm 2- to 5-percent glucose solution...
> A high degree of oiling, initial resistance to self-feeding, or bloody droppings are not reliable indicators of a bird's lessened likelihood of survival..."

Birds should be allowed 12-48 hours rehabilitation to allow replenishment of energy resources by rest and eating. The feeding technique used depends on the feeding habits of the individual. If force-feeding is required for Piscivores (fish-eaters), a mixture of mashed fish products, corn oil, and water is used. If birds are self-feeding, live smelt are recommended to produce feeding responses and competition. However, freshly frozen individuals can be used (Williams, 1977).

Grain-eating species are force-fed a mixture, if force-feeding is required, of nutritional supplements (vitamins, minerals, glucose) and food stuffs (mash, Trout Chow, corn oil and water). Self-feeding birds are fed a soft-food starter consisting of starter mash and Trout Chow.

When cleaning oiled waterfowl, it is important to remember that any residue left on the plumage reduces the efficiency of the heating and buoyancy characteristics. At present, the cleaning agent preferred by the I.B.R.C. is Dawn dishwashing detergent (Olive, personal communication July, 1986).

Detergent cleanings require large amounts of hot water (85° to 115°F). The cleaning processes begins by dipping the individual into a basin of hot water, the water being approximately 4 inches deep. The detergent is applied and worked into the feathers. After 30 seconds, the excess detergent is squeezed from the plumage and the bird dipped into a second basin and the process repeated. A third tub is used repeating the process. After three dippings, the bird is placed in a fourth tub where it is thoroughly rinsed. A hot water spray, until feathers resist wetting, is recommended (Williams 1977).

The final cleaning process is drying. This is accomplished by large, specially designed dryers or pet dryers. According to Williams (1977), "the bird is tube-fed hydrating solution, and its feet are protected from excess heat with A&D ointment and cloth wraps." Drying usually takes 20-40 minutes and is done until the down and the feathers under the wings are completely dry. After drying, the birds are returned to their pens and further distrubance is to be avoided.

CARE

Stress is the major problem of care and reducing, or minimizing, stress is the highest priority of care. Stress to captive individuals includes lack of proper nutrition, handling, overcrowding, temperature extremes, sudden noises, presence of human workers, artificial diurnal/nocturnal cycles, dehydration, and disease. Williams (1977) suggests that pens be 0.6m x 2.4m x 0.9cm (2' x 8' x 3/8") and constructed of plywood sheets. Partitions, also of plywood, are constructed so that the pen is compartmentalized. Cover of some sort may be required to prevent flying by the captives. Bedding materials should be kept clean and dry. Williams (1977) recommends the use of two layers. The bottom layer consists of newspaper or foam rubber, the top layer with some type of sorbent material.

Captive individuals should be allowed to swim at the earliest possible opportunity. Although swimming aids further spot removal, the most important aspect is that it

stimulates the birds to preen their feathers into the proper alignment. Small, plastic lined pools (8' to 12') with approximately 12" - 18" of water are all that is needed (Williams 1977). Systems for cleaning and filtering are needed to maintain water quality. After the bird becomes too wet and/or cold to swim, it is returned to the holding pen for preening and drying. Birds should be allowed to swim as often as possible without becoming taxed. Food and rest are usually required between swims.

RELEASE

Individuals are released when they have waterproof plumage. Also, the general condition of the birds should be sufficient to insure survival. After the birds are determined fit for release, they are taken to their original site of capture (depending upon climatic conditions) and released.

SMALL MAMMALS

Little research has been done concerning cleaning of oiled small mammals with the exception of sea otters. The following discussion pertains to sea otters and was taken from the "Contingency Plan for the Cleaning and/or Rehabilitation of Oiled Sea Otters" prepared by the Monterey Bay Aquariam (Monterey Bay Aquariam 1986). Capture of small mammals will be done by the U.S. Fish and Wildlife Service and/or California of Fish and Game.

CLEANING

The animal must be sedated approximately 30 minutes prior to clean-up as cleaning the animal will require a certain amount of physical restraint. The sedated animal is placed in a cleaning area which allows detergent and rinse water to pass through and into a collecting basin (i.e. sink, tub, tank).

The cleaning solution consists of Dawn dishwashing detergent diluted in water at a ratio of 1:16 or 250 to 500 ml of concentrated detergent. Most animals should require no more than 12 liters of cleaning solution with most requiring 6-8 liters. The cleaning solution is applied to the oiled area and massaged into the fur by hand. After application of the cleaning solution, the animal is dipped in a rinsing basin up to its neck and thoroughly dip rinsed. After each dip rinse, the fur is rinsed using a shower head attached to a hose with a water pressure of 30-40 psi. After pressure

rinsing, the process is repeated. The following parameters are used to determine if the animal is clean:

1) Comparison with a clean reference pelt;

2) Fur feels same as unoiled area (slick, not sticky);

3) Fur dries quickly; and,

4) Loft is regained.

Washing and rinsing procedures usually require approximately 40 minutes.

The cleaned animal is pressure rinsed for another 30-40 minutes after the fur is cleaned to remove detergent residue. Entrained air in the rinse water aids in restoration of the insulatory air layer. After secondary rinsing, the animal is dried with a towel and administered an antagonist to reverse the sedation.

The entire process, from sedation through recovery, requires 3-4 hours and four to five individuals per animal. After cleaning is accomplished the animals are returned to the holding area for rehabilitation.

REHABILITATION

Housing of individuals will be according to age, sex, and physical condition. Generally, males and females should be separated as well as young and adults. If young are captured with their mothers, they should be kept together.

Feeding requirements will be determined by species. Food will be fresh and uneaten food removed to prevent spoiling. The amount and diet of each individual will be recorded. Vitamins and supplements will be used as directed by a veterinarian.

During rehabilitation, physical condition will be closely monitored. Daily checks of the animals will be conducted by a veterinarian as needed. Any illnesses, injuries, and/or parasites will be treated during rehabilitation. If euthanasia is required, it will be discussed with the U.S. Fish and Wildlife Service and California Fish and Game and will be conducted in an approved manner.