

WATER OPERATION AND MAINTENANCE

BULLETIN NO. 138

DECEMBER 1986



IN THIS ISSUE

GUIDELINES FOR MANUAL MAINTENANCE MANAGEMENT SYSTEMS (MMS)
FOR WATER O&M PROJECTS

**UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Reclamation**

The Water Operation and Maintenance Bulletin is published quarterly for the benefit of those operating water supply systems. Its principal purpose is to serve as a medium of exchanging operation and maintenance information. It is hoped that the reports herein concerning laborsaving devices and less costly equipment and procedures will result in improved efficiency and reduced costs of the systems for those operators adapting these ideas to their needs.

To assure proper recognition of those individuals whose suggestions are published in the bulletins, the suggestion number as well as the person's name is given. All Bureau offices are reminded to notify their Suggestions Award Committee when a suggestion is adopted.

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Cover photograph:

Downstream face of sluiceway bridge at Mesilla Diversion Dam, which is one of the example structures featured in the appendix.

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Foreword

The Commissioner of the Bureau of Reclamation, by memorandum dated January 18, 1984, directed all regional and project offices to initiate implementation of POMMS (Project Operation and Maintenance Management System) in 1984. A task group was established to evaluate the program for use on irrigation projects and establish guidelines to be used by regional and project offices. It was the conclusion of the task group that POMMS was too complex, and in many cases uneconomical, for use in some of the smaller, single-purpose irrigation projects, and a simple system should be established that may be easily adapted to the POMMS system at a later date. As a result, it was recommended that a manual maintenance management system (MMS), such as a 52-week file with a work order system, be developed for use on irrigation projects. A sample MMS has been developed and tested by the task group and is the subject of this Water O&M Bulletin.

GUIDELINES
for
Manual Maintenance Management Systems (MMS)
for
Water O&M Projects

1. **General** – The apparatus, structures, mechanical equipment, etc., which are parts of water storage, transmission, and distribution systems must be maintained in a satisfactory operating condition at all times. Following an established maintenance program will result in the best service to water users, fewer emergency repairs, better working conditions for maintenance personnel, and lower maintenance costs. Because of the great variety of equipment used on Reclamation projects, these guidelines will serve as an outline or guide for the maintenance procedures which should be carried out.
2. **Preventive Maintenance** – A continuous program of preventive maintenance, combined with equipment overhaul when required, will best suit the needs on Reclamation projects. This method consists of continually performing routine maintenance and adjustment work to the critical items of a structure or facility in a scheduled and organized manner so as to make special inspection and heavy repairs less necessary. Maintenance is applied more specifically to the parts which are known to need repairs or replacement most often. The underlying theory is that proper lubrication, adjustment, and small repairs, applied often enough to the critical parts, will make it less necessary to undertake complete overhaul. Experience shows that breakdowns are reduced, outages shortened, and the frequency for overhaul of most facilities is lessened when preventive maintenance is followed. Depreciation and obsolescence of equipment may often be reduced by using improved repair material and parts which are at least equal to the original. The success of preventive maintenance will depend largely on the alertness of the personnel who work around the equipment. Continuous attention should be given to such things as loose bolts, vibration, leaks, wear, unusual noise, odor, etc.
3. **Safety** – All work should be conducted in a safe manner. A job plan and safety analysis should be completed for each job and reviewed with all involved personnel prior to undertaking the work (see blank form–exhibit 1). Copies of the job plan and safety analysis should be filed in the equipment file.
4. **Work Schedules** – Maintenance work should be scheduled so as to make the best use of available personnel to coincide with favorable weather so far as possible, and to coincide with periods in which outages of the equipment can best be tolerated. In following the preventive maintenance method, the work to be done is spread out over the entire year. This makes more efficient use of personnel. Maintenance work should also be divided into the group which can be done at any time and that which can be done only at times when the equipment can be taken out of service.
5. **Inspection and Preventive Maintenance Checklists** – Each structure or piece of equipment requires inspection and preventive maintenance at specified intervals. In order to carry out such a program, it is necessary to follow an effective but simple method of scheduling the work and keeping records of inspections and repairs. The checklists included in these guidelines as exhibit 2 should be used as a guide to proper maintenance. The time intervals shown represent the average intervals for which the particular items

should be inspected. More or less frequent inspections may be necessary on some items as operating experience or accessibility for maintenance dictates. Anything unusual found on such inspections should be promptly acted upon. The indexed paragraphs following the checklists are intended to give pertinent instructions on what to look for and what to do. However, it is not intended to duplicate instructions already covered in detail in other irrigation manuals, manufacturers' instruction books, or other available publications.

6. Inspection and Maintenance Record Cards – A card system should be kept for recording inspection and maintenance data and is recommended for calling attention to the time when an inspection is due and for recording the data and brief description of the work done. A 5- by 8-inch card, form SVC-140, shown as exhibit 3, is available for this purpose.

The front of this card has spaces for recording the nameplate and other pertinent data for the specific equipment. The back of the card has spaces for recording the dates on which inspections and repair work were done, name of the inspector, a reference to the complete inspection and repair report, a brief description of the work done, and time required for work done. Another card can be used as a continuation of the original card when the latter is filled up. It should be stapled to the original card. Entries should be made on the "Inspection and Maintenance Record" for the detailed semiannual or annual inspection and repair work but not for the routine daily, or weekly inspections, unless some repair work is performed.

A card should be used for each piece of equipment which is subject to scheduled periodic inspection and maintenance. A rotating file system, illustrated in exhibit 4, is suggested. This entire file, including the index tabs, rotates forward as time goes on, with cards removed from the front as work is done and being placed in the back so that for each year (or other inspection interval) the cards come up in the same order. The file should be consulted at least monthly to see what work is due. After the work is completed, the card should be filled in, signed by the maintenance foreman, and placed back in the file.

A suggested file numbering system for the cards is illustrated in exhibit 4. The first symbol consists of the equipment designation symbol (see exhibit 5) plus the location designation, unit number, and activity code. The second symbol is the month in which the inspection and preventive maintenance work is due. For a semiannual card file, the second symbol should show 2 months, and the index tabs should be marked in a similar manner. This file will rotate twice in a year. If desired, a third symbol may be used to indicate the week due.

Since it may be desired at times to find a card applying to some particular piece of equipment which may be at some unknown place in the file, a separate equipment checklist, see exhibit 2, is needed. From this list, the card for any piece of equipment can be promptly located from the card file by the month in which it is filed. The list also serves as a check on file cards which may have been misplaced or lost. The checklist should also show the reference file number.

7. Records of Inspections, Maintenance, and Tests – Keeping records of the inspections, repairs, and tests is an important part of preventive maintenance. It provides a means

of recognizing chronic problems and finding the causes; and provides a basis for estimating what spare parts should be kept on hand and how often repairs will be necessary. The card described in paragraph 6. "Inspection and Maintenance Record Cards" above, when used in the rotating file system, is intended to serve primarily as an index and tickler system to call attention to when inspection should be made and with only a brief reference to what was done. A more detailed report should be made and filed in the reference file for future reference to document extensive or unusual maintenance.

8. Special Work Orders - During the life of a project, extraordinary maintenance or equipment replacement which cannot be scheduled on a routine basis becomes necessary. When this happens, a special request must be made to accomplish this work. In order to assure that the work is performed in an expedient manner and properly documented, it is suggested that a "Work Order" form (Form 7-2053, shown as exhibit 6) be used. This form was developed for use on POMMS; it is easy to use and provides the necessary information to perform the work. Columns on the form, which are applicable to POMMS, can be left blank when used for the manual system.

JOB PLAN AND SAFETY ANALYSIS
RIO GRANDE PROJECT

Activity: _____ _____ _____ _____	Written by: 1. _____ 2. _____ 3. _____ 4. _____	Date Prepared: Submitted by: _____ Reviewed by: _____ Approved by: _____
Personnel and Skill: _____ _____ _____ _____		
Tools and Equipment: _____ _____ _____ _____		
Materials and Supplies: _____ _____ _____ _____		
Safety Equipment: _____ _____ _____ _____		
Environmental Consideration:		NEPA Compliance Date _____
_____ _____ _____ _____		
Job Coordination: (Irrigation Districts, Utility Co., Other Branches, etc.) _____ _____ _____ _____ _____ _____ _____ _____		

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedure

RIO GRANDE PROJECT

DIVERSION DAMS

Equipment and Inspection Checklist

ITEM OF INSPECTION	INSPECTION CARD CODE	INSPECTION INTERVAL	PROCEDURE REFERENCE
Slide gate (general inspection)	HDG*#a-12-? SLG*#a-12-?	Annual	1.01
Radial gate (general inspection)	SLG*#b-12-? RVG*#a-12-?	Annual	1.02
Lubrication of all movable mechanical parts	HDG*#b-2-? SLG*#c-2-? RVG*#b-2-?	Annual	1.03
Canal headgates, sluice gates, and river gates (operation test)	HDG*#c-10-? SLG*#d-10-? RVG*#c-10-?	Annual	1.04
Gas powered gate operator (general inspection)	MOIG*a-12-?	Annual	1.05
Gas powered gate operator (air filter)	MOIG*b-2/4/6/8-?	2 month	1.06

PROCEDURE REFERENCE

1.01

Slide gate
(general inspection)

Annual inspection. - Visual inspection of seals, stems, gates, gate braces and gate guides for signs of cracks, corrosion, deterioration, etc. Close inspection of gate pedestals, neoprene pads, and all movable mechanical parts for signs of corrosion, broken welds, loose bolts, cracks, deterioration, etc.

1.02

Radial gate
(general inspection)

Annual inspection. - Visual inspection of seals, gates, gate braces, and gate guides for signs of cracks, corrosion, deterioration, etc. Close inspection of hoist stands, sheaves, drums, and all movable mechanical parts for signs of corrosion, broken welds, loose bolts, cracks, deterioration, etc. Close inspection of all wire ropes for abrasion, wear, fatigue, corrosion, improper reeving, kinking, and binding. Check to see if all wire ropes have the correct number and placement of wire rope clips and thimbles.

1.03

Lubrication of all
movable mechanical
parts

Annual inspection. - Lubricate all gate stems, grease fitting, wire ropes, and all movable mechanical parts with appropriate lubricants.

1.04

Canal headgates,
sluice gates, and river
gates (operations test)

Annual inspection. - Operate all canal and sluice gates and river gates, under normal operating conditions (average normal head), from the fully closed position to the fully open position and back to fully closed position.

1.05

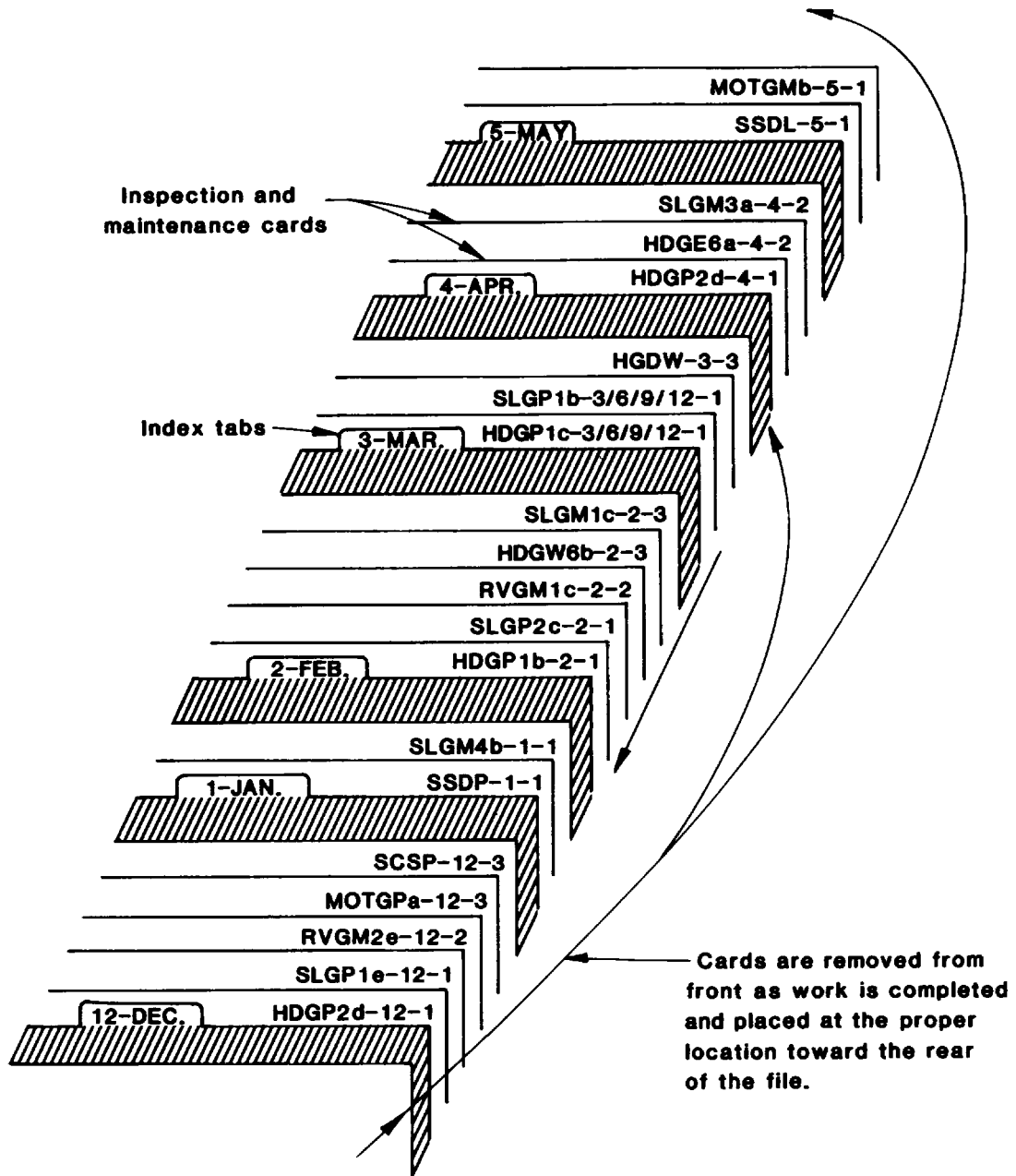
Gas powered gate operator
(general inspection)

Annual inspection. - Inspect and clean crankcase breather, air filtering element, and cooling fans. Change crankcase oil and replace oil in clutch and reduction gear housing. Replace oil filter and lubricate distributor shaft and cam. Regap or replace spark plugs, breaker points, and adjust timing. Inspect starting motor for loose connections and clean bendix with kerosene. Check compression in motor.

1.06

Gas powered gate operator
(air filter)

2-month inspection. - Inspect and clean air filter and replace oil in filter bowl.



FILE NO.

1st. Symbol=Equipment designation symbol followed by a location designation, unit number and activity code.

2nd Symbol=Month due.

3rd Symbol=Week due.

ROTATING CARD FILE SYSTEM FOR MAINTENANCE SCHEDULES

EQUIPMENT DESIGNATION SYMBOLS

<u>Item</u>	<u>Code</u>
Air compressor	AIR
Aqueduct	AQU
Battery	BAT
Bridge	BRG
Building	BUI
Canal	CAN
Check gate	CKG
Check structure	CKS
Communication	COM
Concrete structure	COS
Crane	CRA
Dam	DAM
Desilting works	DEW
Dike	DIK
Diversion dam	DVD
Drop structure	DRS
Elevator	ELV
Equipment light	ELT
Equipment heavy	EHY
Fish facility	FIF
Flume	FLU
Generator	GEN
Grounds	GRD
Head gate	HDG
Instrumentation	INS
Levees	LEV
Motor	MOT
Motor (gas)	MOTG
Motor (electric)	MOTE
Outlet works	OLW
Outlet works gate	OWG
Penstock	PEN
Penstock gate	PEG
Penstock valve	PEV
Pump	PUM
Pumping plant	PUP
Radial gate	RDG
Recreation area	RCA
Reservoir	RES
River gate	RVG
Roads	RDS
Security and safety devices	SSD
Sewage	SEW
Siphon	SIP
Sluice gate	SLG
Spillway gate	SPG
Spillway	SPY
Vehicle	VEH
Ventilation	VEN
Wasteway	WAS
Wells	WEL

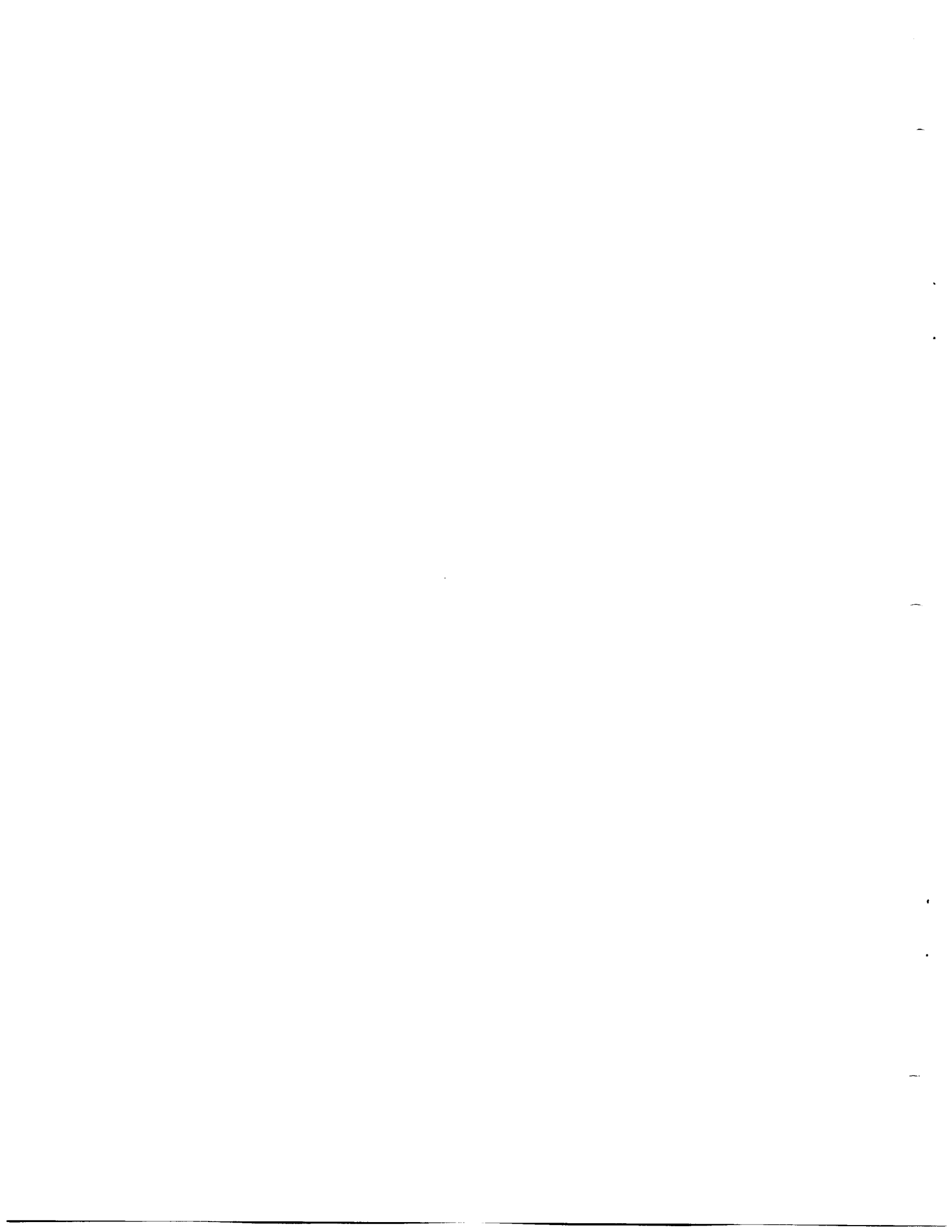


APPENDIX

SAMPLE MMS

Percha, Leasburg, and Mesilla Diversion Dams

Rio Grande Project



A manual MMS has been developed for use on the Rio Grande Project to perform preventive maintenance on three diversion facilities.

The most northerly Diversion Facility of the project is the Percha Diversion Dam which is located 2 miles south of Caballo Dam on the Rio Grande (see the location map). The facility was constructed in 1918 and is a concrete ogee weir structure with two radial sluice gates on the Rio Grande and eight cast iron slide gates for water delivery to the Arrey Canal. All gates at this facility, except for two slide gates, are operated with a four-cycle, two-cylinder, gasoline-powered engine. The two slide gates that are not operated by this engine are electrically operated.

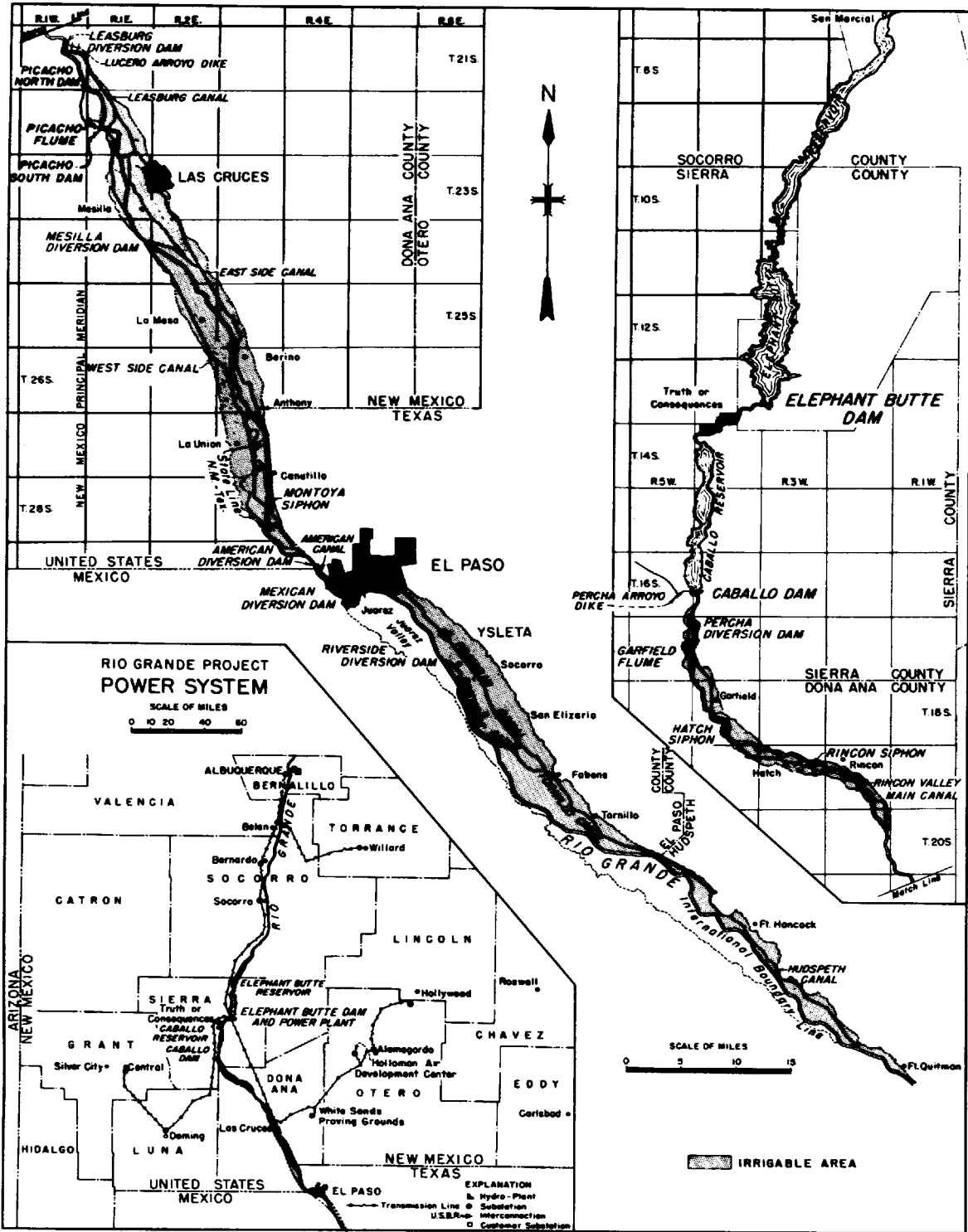
The next Diversion Facility of the project is the Leasburg Diversion Dam. This diversion dam is located on the Rio Grande about 15 miles northwest of Las Cruces, New Mexico (see location map). This facility was constructed in 1907 and the crest was raised 1.25 feet in 1919. The structure is a concrete ogee weir structure with three wooden slide gates on the Rio Grande and seven steel slide gates for water delivery to the Leasburg Canal. All gates are powered by a four-cycle, two-cylinder, gasoline-powered engine.

The third Diversion Facility of the project is the Mesilla Diversion Dam which is located 6 miles south of Las Cruces, New Mexico, on the Rio Grande. This facility was constructed in 1916, and the crest was raised 1.66 feet in 1940. The structure is a concrete weir, radial gate structure with 13 radial gates on the Rio Grande, and two canal headings with eight cast iron slide gates on the west side, and six cast iron slide gates on the east side.

All three Diversion Dams are maintained by a maintenance crew of four, including one supervisor. One day of the week the field supervisor reports to the main office to discuss his crews' activities in the field and receive any work orders (attached) or copies of Inspection and Maintenance Record Cards (attached) for the following month. Upon completion of the work, the appropriate work order form or copy of the Inspection and Maintenance Record Card is filled out and returned to the main office. The work orders are filed by Facility name, while the information on the copies of the Inspection and Maintenance Record Cards is transferred to the original card, a report is made, the card is filed by month, and a copy of the card is filed by Facility name.

A work order can be turned in by anyone involved in project O&M. The crew foreman is responsible for preparing a Job Plan and Safety Analysis for each job and recording labor and materials used on the reverse side of the work order form. All original documents are kept in the El Paso Office and are monitored by the Engineering and Maintenance Branch. Several sample work order forms and Inspection and Maintenance Record Cards are attached.

Rio Grande Project



Rio Grande Project

Outlet works: Uncontrolled concrete conduit through base of dike.
Capacity at El. 3930 140 ft³/s

Diversion Facilities

PERCHA ARROYO DIKE*

Type: Rock-faced earthfill
Location: On Percha Arroyo, 1 mi west of Caballo Dam.
Year completed: 1939
Dimensions:
Structural height 29 ft
Hydraulic height 10 ft
Total crest length 2,489 ft
Crest elevation 4200.0 ft
Volume 193,000 yd³
Spillway: None
Headworks: Flood diversion channel, no gates, highway bridge and drop chute into Caballo Reservoir.
Diversion capacity 30,000 ft³/s

*Dike constructed to divert storm runoff into Caballo Reservoir; no direct connection with irrigation system.

PERCHA DIVERSION DAM

Type: Concrete ogee weir, embankment wings
Location: On the Rio Grande, about 2 mi south of Caballo Dam.
Year completed: 1918
Dimensions:
Structural height 18.5 ft
Hydraulic height 8 ft
Weir crest length 350 ft
Total crest length 2,720 ft
Crest elevation 4103.0 ft
Volume 43,200 yd³
Spillway: Overflow weir, 2 radial sluice gates, each 20- by 8-ft.
Headworks: Rincon Valley Main Canal headworks at west abutment: 8 slide gates, each 4.3 by 3.75 ft.
Diversion capacity 350 ft³/s

LEASBURG DIVERSION DAM

Type: Concrete ogee weir, embankment wings.
Location: On the Rio Grande, about 15 mi northwest of Las Cruces, N. Mex.
Year completed: 1907. Crest raised 1.25 ft in 1919.
Dimensions:
Structural height 10 ft
Hydraulic height 7 ft
Total crest length, dam, including weir 2,865 ft
Weir crest length 600 ft
Weir crest elevation 3922.25 ft
Volume 22,500 yd³
Spillway: Overflow weir, 3 slide sluice gates, each 5 by 8 ft.
Capacity 17,000 ft³/s
Headworks: Leasburg Canal headworks at abutment; 7 slide gates 5 by 6.75 ft.
Diversion capacity 625 ft³/s

MESILLA DIVERSION DAM

Type: Concrete weir, radial gate structure
Location: On the Rio Grande, 6 mi south of Las Cruces, N. Mex.
Year completed: 1916. Crest raised 1.66 ft in 1940.

Dimensions:
Structural height 22 ft
Hydraulic height 10 ft
Weir crest length 303 ft
Crest elevation 3819.83 ft
Volume 2,900 yd³
Spillways: Nine radial gates, each 21.58 by 6 ft; 4 radial gates, each 21.58 by 8.42 ft.
Capacity 15,000 ft³/s
Headworks: Canal headworks at each abutment. 8 slide gates, each 4.33 by 3.75 ft at west end; 6 slide gates, each 4.33 by 3.75 ft at east end.
Diversion capacity
West side 650 ft³/s
East side 300 ft³/s

AMERICAN DIVERSION DAM*

Type: Radial gate structure between river levees
Location: On the Rio Grande at El Paso, Tex.
Year completed: 1938
Dimensions:
Structural height 18 ft
Hydraulic height 5 ft
Weir crest length 286 ft
Crest elevation 3683.5 ft
Volume 2,900 yd³
Spillway: Thirteen radial gates, each 20 by 7.5 ft
Capacity 12,000 ft³/s
Headworks: American Canal headworks at east abutment; 2 radial gates, each 20 by 11 ft.
Diversion capacity 1,200 ft³/s

RIVERSIDE DIVERSION DAM

Type: Concrete weir, radial gate structure
Location: On the Rio Grande, 15 mi south-east of El Paso.
Year completed: 1928
Dimensions:
Structural height 17.5 ft
Hydraulic height 8 ft
Weir crest length 267 ft
Crest elevation 3621.07 ft
Volume 2,500 yd³
Spillway: Six radial gates, each 16 by 8.17 ft, overflow weir.
Capacity 11,000 ft³/s
Headworks: Riverside Canal headworks at east abutment; 5 radial gates, each 16 by 6 ft.
Diversion capacity 900 ft³/s

*These are the flood discharges which the International Boundary and Water Commission is using for the Rio Grande Channelization Project at the indicated points and are not necessarily the maximum which the dams will pass safely, nor which they were designed to pass.

*American Diversion Dam and Canal constructed and operated by American Section, International Boundary and Water Commission, United States-Mexico, for the diversion and allocation of water in accordance with treaty between the United States and Mexico.

Carriage Facilities

RINCON VALLEY MAIN CANAL

Location: From Percha Diversion Dam generally southeast along Rio Grande.
Construction period: 1916-19
Length 28.1 mi
Diversion capacity 350 ft³/s

MAINTENANCE WORK ACTION

Work Action No. 153

Priority Code 3

Work Order No. 149+150

- (1) Emergency
- (2) Urgent (within one week)
- (3) Normal-Date Required Oct. 31, 1985
- (4) Next Shutdown (Winter Maintenance)
- (5) Inclement Weather Activities

Work Name and Location MESILLA DIVERSION DAM

Describe Work Requested, Recommended, and Justification

1. INSTALL FIRST AID KIT + FIRE EXTINGUISHER
ON WALL IN MESILLA BLOCK HOUSE
2. PAINT METER HOUSING YELLOW + BLACK
STRIPES @ 45°

Work Authorized by MBSman

Date 9/26/85

Maintenance Action Taken, Recommendation, Problems Encountered (include number of people, hours worked, craft used, etc.)

Trip to Mesilla Dam - Paint meter box yellow and
let dry - install first aid kit and fire
extinguisher bracket to hang fire extinguisher
Two men worked 3 hours each to include
travel time - used hand tools, paint,
and provided: screws

Completed by Carlos Madrid Date Completed 10-3-85

MAINTENANCE WORK ACTION

Work Action No. 157

Priority Code 3

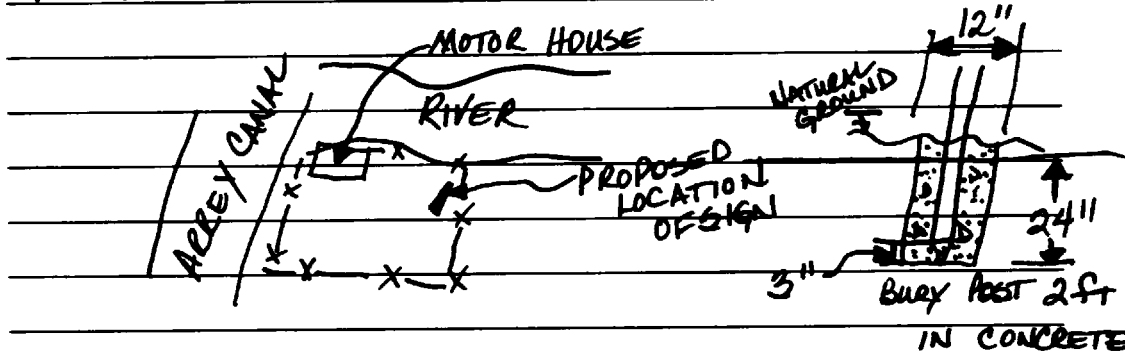
Work Order No. 146

- (1) Emergency
- (2) Urgent (within one week)
- (3) Normal-Date Required SEPT 27, 1985
- (4) Next Shutdown (Winter Maintenance)
- (5) Inclement Weather Activities

Work Name and Location PERCHA DIVERSION DAM

Describe Work Requested, Recommended, and Justification

1. INSTALL SIREN SIGN ~~OUT~~ IN ~~THE~~ FENCED AREA



Work Authorized by Al Barnes

Date 9/9/85

Maintenance Action Taken, Recommendation, Problems Encountered (include number of people, hours worked, craft used, etc.)

Pick up pipe at Bugmen Steel - transport to job site -
 Dig Anchor hole and fill with concrete - look for good
 gravel and haul to job site to mix concrete - set steel posts
 in concrete and leave to set overnight - Attach sign to
 posts by means of welding - 2 men two trips to Percha
 work 16 hours each to include travel time
 - welder - cutting torch

Completed by Carlos Madrid Date Completed 9-17-85

MAINTENANCE WORK ACTION

Work Action No. 106

Priority Code 3

Work Order No. 106

- (1) Emergency
- (2) Urgent (within one week) 6-30-85
- (3) Normal-Date Required MAR. 29, 1985
- (4) Next Shutdown (Winter Maintenance)
- (5) Inclement Weather Activities

Work Name and Location MESILLA AUTOMATION

Describe Work Requested, Recommended, and Justification

- ① INSTALL GATE CONTROLLER
- ② CONTROL PANEL
- ③ ADJUST WIRE ROPE TO OPERATE GATE

Work Authorized by MBCoors

Date 3-11-85

Maintenance Action Taken, Recommendation, Problems Encountered (include number of people, hours worked, craft used, etc.)

- ① Drill holes on base of controller unit, hoist in place with
Muckle boom crane and secure to anchor bolts - connect gate
wire ropes to power drum 4-2-85
- ② Drill holes in concrete for anchor bolts and place control panel
in position, done 4-3-85
- ③ Replace broken bolt in power drum and cable tie down - adjust wire
ropes to pull even and make gate operational. 2 men 8 hrs on 5-8-85
Muckle boom - crane, hits drill - power drill - cutting torch - hand tools

Completed by Carlos Madrid
Maint. Dept.

Date Completed 6-17-85

MAINTENANCE WORK ACTION

Work Action No. _____

Priority Code _____

Work Order No. _____

- (1) Emergency
- (2) Urgent (within one week)
- (3) Normal-Date Required _____
- (4) Next Shutdown (Winter Maintenance)
- (5) Inclement Weather Activities

Work Name and Location _____

Describe Work Requested, Recommended, and Justification

Work Authorized by _____

Date _____

Maintenance Action Taken, Recommendation, Problems Encountered (include number of people, hours worked, craft used, etc.)

Completed by _____ Date Completed _____

EQUIPMENT HEADGATE ON EASTSIDE CANAL

FACILITY Mesilla Diversion Dam LOCATION 6th gate of north dam

INSPECTIONS FREQUENCY 12 months

EQUIPMENT DATA

Specification/Solicitation _____ Date Furnished _____

Supplier _____ Type _____

MFR _____ Size _____

Model or Style No. _____

INSPECTION AND MAINTENANCE RECORD

DATE	INSPECTED BY	CONDITION FOUND OR DESCRIPTION OF WORK DONE	HOURS	MATERIAL
12-19-84	M. Fourn	PROCEDURE 1.01 SEAL DETERIORATED ANGLE IRON MISSING - PEDestal CRACKED - NEED PAINT - NEOPRENE PAD MISSING	1/4	

EQUIPMENT RIVER GATES
MESILLA
 FACILITY DIVERSION DAM LOCATION 4th GATE FROM WEST END INSPECTIONS FREQUENCY 12 months

EQUIPMENT DATA

Specification/Solicitation _____ Date Furnished _____
 Supplier _____ Type _____
 MFR _____ Size _____
 Model or Style No. _____

INSPECTION AND MAINTENANCE RECORD

DATE	INSPECTED BY	CONDITION FOUND OR DESCRIPTION OF WORK DONE	HOURS	MATERIAL
12-18-84	M. Sierra	PROCEDURE 1.01 SLIGHT CORROSION ON GATE - THIMBLES ARE MISSING. WIRE ROPE NEEDS LUBRICATION.	1/4	

EQUIPMENT GAS POWER GATE OPERATOR

FACILITY LEASBURG DIVERSION DAM LOCATION West Bank of River
 at Damsite

INSPECTIONS FREQUENCY 6 months

EQUIPMENT DATA

Specification/Solicitation 336855 Date Furnished _____

Supplier Serial No. 5088934 Type Wisconsin air cooled

MFR Teledyne Size 4 - cylinder - 8 - cycle

Model or Style No. VH4D

INSPECTION AND MAINTENANCE RECORD

DATE	INSPECTED BY	CONDITION FOUND OR DESCRIPTION OF WORK DONE	HOURS	MATERIAL
12-4-84	M. SIMA	PROCEDURE 1.07	1	NONE
6-1-85	J. DEFEA	NO ADJUSTMENT NECESSARY	1/2	—