Description of document:	International Boundary and Water Commission (USIBWC) Crisis Management Plan, 2009-2012
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Source of document:	Freedom of Information Act Request USIBWC Attn: FOIA - Legal Office 4171 N. Mesa, Suite C-100 El Paso, Texas 79902 Email: christopher.parker@ibwc.gov Fax: (915) 832-4196
Note:	See following page for list of included items

INCLUDED ITEMS

- International Boundary and Water Commission United States Section 2009 Crisis Management Plan
- International Boundary & Water Commission United States & Mexico United States Section Flood and Emergency Operations Manual Amistad Dam and Power Plant Project, Revised June 2012
- International Boundary and Water Commission United States And Mexico United States Section Flood Emergency Operations Manual Presidio Project, May 2012
- International Boundary & Water Commission United States & Mexico United States Section Mercedes Field Office Flood Emergency Operations Manual Lower Rio Grande Flood Control Project, May 2012
- International Boundary And Water Commission United States and Mexico United States Section Flood Emergency Operations Manual Upper Rio Grande Projects, April 2012
- Continuity of Operations Plan United States International Boundary and Water Commission Mercedes Field Office, April 20, 2009
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Upper Rio Grande Field Office, October 2008
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Amistad Field Office, April 2009
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Falcon Dam and Power Plant, October 2008
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Nogales Field Office, October 2008
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Presidio Project, October 2008
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission San Diego Field Office, April 2009
- Continuity of Operations Plan (COOP) United States International Boundary and Water Commission Yuma Field Office, October 2008

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

January 8, 2014

Subject: USIBWC FOIA received October 19, 2013 RE: USIBWC Crisis Management Plan

This letter is in response to your Freedom of Information Act request sent to the U.S. Section, International Boundary and Water Commission (USIBWC). Briefly, your submittal requested a copy of a copy of the IBWC Crisis Management Plan.

After search, the agency has enclosed documentation responsive to your request. Any and all fees related to your request are waived.

If you feel this determination is in error, it may be appealed to the Agency. Appeals should be addressed to the USIBWC Legal Office, 4171 N. Mesa, Ste. C100, El Paso, TX 79902, and should be clearly identified as such on the letter by writing "Freedom of Information Act Appeal." Appeals must be in writing and filed within 30 days from receipt of the Agency's response.

If you have any questions, or would like to discuss this matter, please feel free to contact our office at 915-832-4794. Please refer to FOIA 2013-2 in all future correspondence.

Sincerely,

/S/
Christopher A. Parker
Interim FOIA Officer

Attachments as Stated

International Boundary And Water Commission,
United States Section

2009 Crisis Management Plan

Produced by: Special Operations Division

Office of Security and Emergency Management

Contents

Appendix A: Emergency Action Plan, Emergency Management Plan or Flood Control Manuals

Appendix B: Recovery Plan

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Section One “Overview”

Since Hurricane Katrina, an extra emphasis has been placed on establishing and maintaining viable Emergency Management programs in government. In 2008, the need for a functional Emergency Management program became evident for the USIBWC following Hurricane Dolly and the Presidio Flood event. The USIBWC owns and operates dams, wastewater treatment facilities, and a significant levee system which protects millions of binational residents from flooding. In addition, the agency produces electricity at two of its facilities which creates a unique interdependent system of flood control and power production.

In the event of a dam failure, uncontrolled release of the water stored behind USIBWC facilities could be capable of causing high loss of life and great property damage. In addition, the failure of certain facilities could cause severe long-term consequences to the border economy.

Because of the potential consequences associated with dam and wastewater treatment facility failure, it is vital that the USIBWC actively continue to construct and maintain an Emergency Management program that meets and exceeds the recommended standards prescribed by DHS and FEMA. The Special Operations Division (SOD) will continue to spearhead this effort and meet the challenges posed by disasters both manmade and natural that threaten the vitality of agency operations.

Section Two “Risk Management”

Risk management identifies the appropriate protective strategies and measures as part of a cost-effective plan to protect USIBWC facilities and prevent or minimize the potential for a successful attack.

The USIBWC risk management plan goes beyond security and protective measures and incorporates crisis management into its overall approach to securing agency infrastructure. This comprehensive approach to risk also considers what happens in the event of damage to the facility, if dam failure is imminent, if the facility has failed, and by minimizing the safety and economic impacts caused by the damage or failure.

Section Three “Crisis Management Programs”

In a general sense, crisis management consists of planning for and responding to any emergency incidents that might occur. The USIBWC Special Operations Division has decided to meet its emergency management goals by focusing on four major components:

- Emergency Action Plans;
- Recovery Plans;
- Continuity Plans; and
- Exercises

Emergency Action Plans

Dam safety programs have long relied on Emergency Action Plans (EAPs) to guide response in critical situations. The objectives of EAPs are to mobilize a pre-planned response to prevent uncontrolled release of water from the dam, and to initiate community actions to maintain public safety in a case such as a release.

Recovery Plans

In addition to the immediate safety issues addressed in the EAP, damage or failure of a facility can have longer term economic impacts. These impacts will certainly impact the USIBWC but may also have wider impacts on the border community, industry, or the regional economy. Therefore, rapid restoration of USIBWC facility functions might be necessary to help minimize such impacts. Recovery plans can be used to prepare for quick repair of damage. Recovery plans might address both short-term repairs to partially restore project functions and long-term repairs to fully restore the project.

Continuity Plans

During an adverse situation, it might be necessary to continue facility operations with the absence of key personnel. These conditions were present following the untimely passing of former Commissioner Carlos Marin during the Presidio Flood event. Continuity planning can be used to identify personnel with necessary skill sets and to define shifts of roles and responsibilities to respond to the major absence of personnel.

Exercises

While planning is essential for effective crisis management, to be more fully prepared it is necessary to conduct periodic exercises testing implementation of those plans. Exercises will raise general awareness of potential crisis situations. They will ensure that key staff members are familiar with the plans and understand their roles and expected actions. In addition, exercises can help identify shortcomings in plans leading to improvements.

Section Four "Emergency Action Plans"

Emergency Action Plans (EAPs) are intended to guide dam owners and operators in the prevention, response, and mitigation of impending serious incidents and minimizing the ensuing life safety consequences and property damage. EAPs include notification lists to mobilize resources to prevent imminent failures during emergency situations and to communicate appropriate danger warnings to local authorities to the public. They might also address a variety of preparedness issues such as alternative communications systems or emergency supplies and equipment. EAPs must be site-specific because conditions are unique at each dam and downstream of that dam. The USIBWC has adopted the standards prescribed by FEMA 64 *Emergency Action Planning for Dam Owners* for developing and maintaining EAPs.

Each dam has been tasked with producing an EAP for its site in accordance with FEMA 64 standards. Concerning the USIBWC, all EAPs have been received by the Special Operations Division, reviewed for accuracy and content, and certified in accordance with FEMA standards (minus the inundation maps). In addition, each dam will be responsible for updating the content of its respective EAP on an annual basis. The EAPs will also be shared with local emergency management officials once the inundation maps are received from the GIS section.

Basic Elements of an EAP

The EAP consists of several components:

- A notification flowchart for emergency levels one two and three;
- An emergency detection, evaluation, and classification guide that enables dam managers to provide early detection and timely evaluation of any situation that requires an emergency action;
- A responsibilities section that determines the dissemination of EAP-related tasks in order to ensure effective and timely action in the event of an emergency;
- A preparedness segment which refers to actions to be taken before an emergency to prevent or alleviate the effects of a dam failure or large operational releases and to facilitate the response to emergencies;
- Inundation Maps to be used by the dam management and local emergency management officials to facilitate timely notification and evacuation of areas affected by a dam failure;
- Appendices which will be used to provide information that supports and supplements the material used in the development and implementation of the EAP.

Coordination

In addition to the proper development and maintenance of an EAP, it is important to establish and sustain relationships with local, county, state and federal emergency management officials. Once relationships are established, the annual update of the EAP should be coordinated with emergency management officials so that external opinions and expertise are incorporated into the creation of the document as well. When the inundation maps are developed, they will be distributed to local emergency management officials so that they can then create evacuation maps and properly plan for contingencies. It is also very important to coordinate with external emergency management entities so that everyone understands their responsibilities and roles in the event of an incident. In spring 2009, the agency Emergency Manager plans to travel to FEMA Region Six HQ, the Texas Department of Emergency Management and to key county Emergency Management offices in order to cultivate relationships with governmental partners and to educate these entities concerning the USIWBC mission, and what capabilities the agency can employ during an emergency.

Communications

Reliable communications are essential during emergency situations in order to quickly exchange critical information among key individuals and organizations. Locally, dam managers will employ various modes of communication to relay important information to headquarters and local emergency management officials, the media used will include landlines, cell phones, satellite phones and radios. At headquarters, the Crisis Action Team is responsible for conveying information to emergency management officials as well (mostly State and Federal levels); this will be accomplished using situational reports (SITREPs) every 24 hours or more frequently if necessitated.

Evacuation

Evacuation planning and implementation is the responsibility of state and local officials. The USIBWC will NOT usurp this responsibility; however, there may be situations where recreational facilities or residences just below the dam may require a timelier warning, in this case, local management will do what it can to prevent loss of life by providing a timely warning. Local management will also coordinate with local officials in order to provide as much notification as possible so that people can be evacuated with as much warning time as possible.

Declaring and Terminating the Emergency

Local management in coordination with higher management will be responsible for making decisions that an emergency condition exists or no longer exists at the dam or that the level of the emergency has changed. The EAP designates the Area Operations Manager as the individual responsible for orchestrating the declaration of an emergency. State and local officials are responsible for initiation and termination of evacuation or

disaster response activities. Most local emergency management officials will make decisions based on the recommendations of dam management so USIBWC professional input is vital to activating and deactivating emergency response efforts.

Post Emergency Evaluation

Following any emergency, all participants should participate in an after action review which identifies:

- Events occurring before, during and following an emergency;
- Significant actions taken by each participant and possible improvements for future emergencies; and
- Strengths and deficiencies found in procedures, materials, equipment, staffing levels and leadership.

Maintaining an EAP

Without periodic maintenance, the EAP will become out-dated and lose its effectiveness. Upon inception of the agency Emergency Management program, all dam EAPs were at least a decade old and had not been updated since their respective development. SOD has mandated that EAPs be reviewed and updated on an annual basis and be exercised in accordance with the newly developed emergency exercise cycle. Changes such as updated mapping must be incorporated immediately in order to facilitate proper emergency response from local officials. In addition, changes in personnel and phone numbers should be updated accordingly.

Sensitive Information

USIBWC EAPs are considered sensitive documents. It is necessary that the distribution be exclusive to those with a viable need to know. Entities with a need to know will include emergency management agencies and law enforcement. EAP distribution requests must first be reviewed and authorized by the Special Operations Division.

Section Five "Recovery Plans"

USIBWC dam and wastewater projects provide a wide range of benefits to a broad community. These include economic, environmental, and social benefits including irrigation, electric power generation, "black start" capability, water storage, recreation, and flood mitigation. Disruption of USIBWC dams for extended periods of time could have economically devastating regional or binational consequences.

Recent infrastructural failures throughout the United States have increased emphasis on the development of recovery plans. The USIBWC will focus its emergency management planning efforts on recovery planning in late 2009/ early 2010 following EAP development and Continuity of Operations Planning.

Recovery Plan Objectives

The objectives of developing and periodically updating recovery plans are to:

- Minimize the extent of damage progression;
- Restore project function, beginning just after initial response;
- Minimize economic losses through quick restoration and function; and
- Address all types of potential hazards (natural, accidental, manmade).

Recovery Plan Contents

The recovery plan (RP) should make extensive references to specific content of the project EAP or Emergency Response Plan (for wastewater treatment facilities). This will minimize redundancy of information, make the plan simpler, and eliminate contradictory information. The USIWBC will follow the guidelines established by the United States Army Corps of Engineers in reference to developing RPs.

The RP will address each critical component of the facility. The emergency management team will identify the likely hazards and predict the type and magnitude of damage from those hazards. Based on that probable damage, there will be an order of magnitude estimate of the direct and indirect consequences; a list of options to minimize consequences will follow.

Once the hazards are identified, it is essential that the facility do whatever is possible to stockpile and procure supplies that can mitigate the identified disaster scenarios. In the event of a disaster, this will enable the local management team to reduce the impact of the disaster and subsequent damage to the community.

Response Coordination

In the event that an incident occurs that causes great damage to the facility, multiple agencies at all governmental levels will likely become involved as they will provide initial and continued response. Because of the joint nature of emergency response, it is essential that local management and the Special Operations Division maintain constructive relationships with response entities. Inter-agency response will improve disaster mitigation efforts.

Financial Information

Major recovery activities are dependent on available funding. For common types of project components, the RP should include tables that list the types of damage that might be expected, followed by various replacement and repair options to restore partial or full function along with the probable time and cost for those options.

Sensitive Information

USIBWC RPs will be considered sensitive documents. It is necessary that the distribution be exclusive to those with a viable need to know. Entities with a need to know will include emergency management agencies and law enforcement. RP distribution requests must first be reviewed and authorized by the Special Operations Division.

Section Six "Continuity Plans"

Continuity planning helps facilitate the performance of an organization's essential functions during any situation that may disrupt normal operations. The continuity plan will encompass various topics that are essential to continued agency operation. The USIBWC SOD has determined that the FEMA COOP template will be the adopted agency standard. The USIBWC HQ COOP was completed in January 2009. By the end of April 2009, all field offices will submit their COOPs to SOD for review and subsequent certification. The minimum components of the COOP will consist of the following:

- Identification of essential functions;
- Interoperable communications;
- Delegations of authority;
- Alternate facilities;
- Vital Records;
- Human Capital; and
- Computer Disruptions

Identification of Essential Functions

For the USIBWC field sites, management will want to consider the following when identifying essential functions:

- Controls and systems that open or close gates and valves;
- Personnel who manipulate those systems and controls;
- Personnel who decide when and how much to adjust release of water;
- Dam safety engineers authorized to make decisions on the safety of the dam;
- Collection of data that forms the basis of such decisions; and
- Communication between those operating the controls and those deciding on releases.

Interoperable Communications

Continuity of communications could become an issue during a crisis for a number of reasons. Phone systems (both cellular and land lines) can experience varying degrees of disruption during and following an incident, relocation can disrupt computer communications and radios can fail at times due to terrain. The USIBWC emergency management team in conjunction with the Information Management Division is actively working the continuity of agency communications. The Las Cruces Office was recently designated as the agency alternate location for computer network redundancy.

Delegations of Authority

Certain types of emergency situations might result in the temporary or permanent loss or incapacitation of key personnel. COOPs will clarify what decision-making authority will be transferred in various circumstances.

Alternate Facilities

COOPs will also address relocation of essential functions if the primary location has been disrupted. For example, in the event that the HQ building experiences an incident requiring temporary relocation, essential personnel will relocate to the American Dam office in order to continue operations. If the American Dam facility is uninhabitable, the Las Cruces Office will become the tertiary working location until the HQ or American Dam Office becomes habitable.

Vital Records

For field offices, vital records will consist at the minimum of data concerning stream-flow upstream and downstream of the dam, expected near-term inflows, release rates for various gate positions and reservoir levels. Other information such as important records, personnel information, etc. should be secured as well. Computer systems should be backed up as well.

Human Capital

The USIBWC is dependent on its staff for successful operation. COOPs will address how to maintain essential functions in case of serious disruption to staff. Proper planning in the COOP will identify the staff needed to support essential functions; this will include the number of people and skills required.

Section Seven "Exercises"

Emergencies at dams, wastewater treatment facilities and on levees are not uncommon events. Therefore, training and exercises are necessary to maintain operational readiness, timeliness, and responsiveness. The USIBWC SOD assessed the previous testing structure and modified the cycle to reflect newly defined requirements as defined by FEMA 64.

Workshops

Workshops are an excellent source of educating essential employees as to what their responsibilities are in the event of an emergency. Workshops enable personnel to discuss and describe technical matters, responsibilities, and procedures. In addition, workshops are used to determine specific objectives, develop potential scenarios, and to achieve specific goals. The USIBWC engages in an annual flood control workshop at the facilities located on the Rio Grande.

Table Top Exercises

The table top exercise involves meeting of essential personnel in a conference room environment. The format is usually informal with minimum stress involved. The exercise begins with the description of a simulated event and proceeds with discussions by the participants to evaluate the plan and response procedures and to resolve concerns regarding coordination and responsibilities. Table top participants are encouraged to discuss issues in depth and develop decisions through slow paced problem solving, rather than rapid, spontaneous decision making that occurs under simulated conditions.

The USIBWC will exercise its first table top scenario in March 2009 using a fictitious scenario, the "Hurricane Cecil Table Top Exercise." This exercise will involve the HQ Crisis Action Team, Amistad Dam, Falcon Dam, and the Lower Rio Grande Flood Control Project. Also in 2009, SOD will exercise the Upper Rio Grande Flood Control Project and the wastewater treatment facilities in San Ysidro, CA and Nogales, AZ.

Functional Exercises

A functional exercise is the highest level exercise that does not involve the full activation of local emergency management personnel and facilities, or test evacuation of residents downstream of the dam. It involves various levels of the project and State and local emergency management personnel; it will also include CILA officials. The functional exercise takes place in a stress-induced environment with time constraints and involves the simulation of facility failure or other specified events that require effective responses by trained personnel. The participants "act out" their actual roles. The exercise is designed to evaluate both the internal capabilities and responses of facility management and the workability of the information in the plan used by emergency management

officials to carry out their responsibilities. The functional exercise is also designed to evaluate the coordination activities between the dam owner and emergency management personnel. The USIBWC SOD will develop scenarios in early 2010 and exercise all field offices and headquarters in the summer of 2010.

Full-Scale Exercises

A full-scale exercise is the most complex level of exercise as all resources are mobilized to enable participants to experience conditions as close to real world conditions as possible. The basic difference between functional and full-scale exercises is that a full-scale exercise involves actual field movement and mobilization, whereas field activity is only simulated in a functional exercise. The primary objectives of a functional or full-scale exercise are to:

- Reveal the strengths and weaknesses of the plan, including specified internal actions, external notification procedures, and adequacy of other information such as inundation maps.
- Reveal deficiencies in resources and information available to the dam owner and State and local agencies.
- Improve coordination efforts between the USIWBC and emergency management entities.
- Clarify the roles and responsibilities of the USIBWC and emergency management officials.
- Improve individual performance of essential personnel.
- Gain public recognition of emergency plans.
- Test the monitoring, sensing, and warning equipment at remote facilities.
- Test the functionality of equipment.

The USIBWC plans to engage in full-scale exercising in the summer of 2011.

Frequency

The USIBWC will have table top exercises in 2009, functional exercises in 2010 and full-scale exercises in 2011. Following the completion of the initial exercise cycle, the USIBWC will progress to having table top exercises on an annual basis, a functional exercise every three years and a full-scale exercise every five years. This cycle exceeds FEMA recommended standards regarding the frequency of exercises.

Section Eight "The Way Forward"

The USIBWC Emergency Management program has come a long way since its inception in January 2008. Prior to January 2008, the agency only engaged in annual flood workshops. The back to back disasters of Hurricane Dolly and the Presidio Flood in summer 2008 amplified the need for the agency to develop a viable emergency management program and plan. Since the summer of 2008, EAPs have been submitted, a Crisis Action Team and Emergency Operations Center Standard Operating Procedure was developed, COOP templates were developed and distributed to the field with a suspense date of April 2009, and two emergencies were successfully mitigated and managed.

The future of the program appears very bright. EAPs and emergency response plans will be updated on an annual basis, DPs will be submitted by early 2010, and exercises will occur to ensure that essential personnel are able to successfully manage and mitigate the impact of an emergency. In addition, communication with fellow government agencies will be improved as the education campaign is scheduled to occur in April 2009. The Special Operations Division will continue to support agency operations through hard work, dedication, and by providing a plan for successfully preparing USIBWC personnel for managing disasters.

Appendix A

In this section, you will insert the facility's respective Emergency Action Plan (applies to Amistad, Falcon, Anzalduas and Retamal); the facility's respective Emergency Management Plan (applies to NIWTP and SBIWTP); and/ or your respective Flood Control Manual (applies to LRGFCP, Presidio, URGFCP, Yuma, and SBIWTP).

Emergency Action Plans: 5 U.S.C. 552(b)(7)(E) and (F)
Emergency Managment Plans: 5 U.S.C. 552(b)(7)(E) and (F)
Flood Control Manuals: Attached. 5 U.S.C. 552(b)(7)(E) and (F)

Appendix B

In this section, you will insert your Disaster Recovery Plan (DRP). DRPs will be created in late 2009/ early 2010 as it is the final component of a holistic emergency response program.

Appendix C

In this section, you will insert your Continuity of Operations Plan (COOP). COOPs are due by the end of April 2009. 5 U.S.C. 552(b)(7)(E) and (F)

Appendix D

Guidelines for Seminars

Seminars can be used to address a wide range of topics. Although the topics may vary, all seminars share the following common attributes.

- They are conducted in a low-stress environment.
- Information is conveyed through different instructional techniques, which may include lectures, multimedia presentations, panel discussions, case study discussions, expert testimony, decision support tools, or any combination thereof.
- Informal discussions are led by a seminar leader.
- There are no real-time "clock" constraints.
- They are effective for both small and large groups.

Prior to participating in a seminar, participants should have a clear understanding of exercise objectives, which can range from developing new standard operating procedures to attaining priority capabilities. Seminars are typically conducted in a lecture-based format with limited feedback or interaction from participants.

Guidelines for Workshops

To be effective, workshops must focus on a specific issue, and the desired outcome, product, or goal must be clearly defined. They provide an ideal forum for:

- collecting or sharing information;
- obtaining new or different perspectives;
- testing new ideas, processes, or procedures;
- training groups to perform coordinated activities;
- problem-solving complex issues;
- obtaining consensus; and/or
- building teams.

Typically, workshops begin with a presentation or briefing, during which the background and rationale for the workshop are conveyed, and specific activities and expected outcomes are delineated. The presentation is typically followed by facilitated breakout sessions, in which workshop participants break into groups for focused discussions of specific issues. Breakout sessions are used to increase participant interaction regarding the issues most relevant to their functional areas.

Ideally, breakout sessions are facilitated by someone with both subject matter knowledge and facilitation experience. If this is not possible, it is more important to have a good facilitator who can keep the discussion on track than to have subject matter knowledge. Following breakout group discussions, the groups reconvene in a plenum session to present outcomes.

Guidelines for a Tabletop Exercise

A tabletop exercise is like a problem-solving or brainstorming session. A tabletop is usually not as tightly structured as a full-scale exercise, so problem statements can be handled in various ways. The facilitator can verbally present general problems, which are then discussed one at a time by the group or they can be verbally addressed to individuals first and then opened to the group.

Another approach is to deliver pre-scripted messages to players. The facilitator presents them, one at a time, to individual participants. The group then discusses the issues raised by the message, using the EOP or other operating plan for guidance. The group determines what, if any, additional information is needed and requests that information. They may take some action if appropriate.

A third option is for players receiving messages to handle them individually, making a decision for the organization they represent. Players then work together, seeking out information and coordinating decisions with each other.

Participants should be provided with reference materials that could include EAPs, maps, and other relevant materials. The tabletop facilitator must have good communication skills and be well informed on applicable plans and organizational responsibilities.

Guidelines for Games

Games are hypothetical situations steered by player actions. Games explore the consequences of player decisions and actions. Therefore, they are excellent tools to use when validating or reinforcing plans and procedures, or evaluating resource requirements.
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Games have the following common characteristics.

- Play unfolds contingent on player decisions.
- They encourage a competitive environment.
- They provide rapid feedback.
- They improve teamwork.
- They foster an environment to practice group problem solving.
- Group message interpretation is tested.
- Interagency coordination is assessed.
- Senior officials become familiar with individual responsibilities.
- Players explore potential future scenarios.
- Consequences of player actions are demonstrated.

A major variable in games is whether consequences of player actions are scripted or random. After each player action or move, the controller presents the outcome. Depending on the game's design, this outcome can be either pre-scripted or decided after play. Identifying critical decision-making points is a major factor in the success of games because players make their evaluated moves at these crucial points.

Due to the usual limitation on number of players, planners are encouraged to open the exercise to observers, if possible. Observers are asked not to participate in discussions and strategy sessions, but can be tasked to make notes and report back to controllers with feedback.

Guidelines for Drills

A drill is a coordinated, supervised activity usually used to validate a specific operation or function in a single agency or organization. A drill is useful as a stand-alone tool, but a series of drills can also be used to prepare several agencies/organizations to collaborate in a full-scale exercise.

Drills typically include the following attributes.

- They have a narrow focus.
- Results from drills are measured against established standards.
- They provide instant feedback.
- They involve a realistic environment.
- They are performed in isolation.
- Players become prepared for exercises that are larger in scope.

Clearly defined plans, policies, and procedures need to be in place. Personnel need to be familiar with those plans and policies, and trained in the processes and procedures to be drilled.

The drill begins when controllers and evaluators are properly stationed. If no safety issues arise, the drill continues until the process is complete, time expires, or objectives are achieved.

During the simulated incident, players must know that they are participating in a drill and not an actual emergency. Controllers ensure that participant behavior remains within predefined boundaries and that entities not involved in the drill (e.g., site security, local law enforcement) are not unnecessarily mobilized.

Evaluators observe behaviors and compare them against established plans, policies, procedures, and standard practices (if applicable). Safety controllers ensure all activity takes place within a safe environment.

Guidelines for Functional Exercises

The functional exercise makes it possible to test the same functions and responses as would be tested in a full-scale exercise, without the high costs or safety risks. Functional exercises are lengthy and complex; they require careful scripting and careful planning, The functional exercise is well-suited to assess the:

- direction and control of emergency management;
- adequacy of plans, policies, procedures, and roles of individual or multiple functions;
- individual and system performance;
- decision-making process;
- communication and information sharing among organizations;
- allocation of resources and personnel; and
- overall adequacy of resources to meet the emergency situation.

The exercise is much more likely to be successful if the participants receive a briefing that covers an overview of objectives, how the exercise will be carried out, the time period to be simulated, and ground rules and procedures. The exercise formally begins with the presentation of the narrative.

The action begins as simulators communicate messages to players, and players respond as they would in a real emergency. The players then make requests of simulators, and simulators react convincingly. This ongoing exchange takes place according to the carefully sequenced scenario of events that governs what takes place, when each event occurs, and the messages used to inform the players. The players should be able to decide among the full range of responses normally available to them during an emergency. Their ability to make decisions, communicate, or otherwise carry out their responsibilities should not be constrained by the exercise situation.

Functional exercises can depict events and situations that would actually occur over an extended time period (one or two weeks or more). In order to include multiple phases of the emergency (preparation, response, recovery, mitigation) in a two-day exercise, it would be necessary to stop the exercise periodically and advance the time by a number of hours or days. These skip-time transitions should be kept to the minimum necessary to cover the scope of the exercise. They can usually be planned to coincide with a natural break point.

To the extent possible, the functional exercise should take place in the same facility and in the same operational configuration that would occur in a real emergency.

Guidelines for Full-Scale Exercises

Full-scale exercises are interactive exercises designed to challenge the system under review in a highly realistic and stressful environment. The realism of the full-scale can be conveyed through on-scene actions and decisions, simulated "victims," communication devices, equipment deployment, and resource and personnel allocation.

Full-scale exercises require a significant investment of planning, time, effort, and resources—it may take 1 to 1½ years to develop a complete exercise package. Despite the intensive effort involved in the planning and implementation phases, full-scale exercises are valuable because they enable an organization to evaluate its ability to perform many functions at once. They are also effective at pinpointing resource and personnel capabilities, revealing planning and resource shortfalls, and testing inter- and intra-organizational coordination.

The full-scale exercise begins in a fashion similar to the functional exercise; whether it is announced or "no notice" depends in part on the objectives. The exercise designer will decide how and when the exercise is to begin. The trigger may simply be a call from dispatch, a radio broadcast, or a telephone call from a private citizen. The beginning for each participant should be as realistic as possible (that is, personnel should receive notification through normal channels).

All decisions and actions by players occur in real time and generate real responses and consequences from other players. The exercise messages may be scripted or visual—staged scenes, props, role-playing victims.

Because the activity during the exercise is at a very high level great care must be given to developing, implementing, and monitoring health and safety plans. The high level of activity also suggests that multiple observers must be on hand to record and assess decisions, outcomes, conflicts, resource use, and the effectiveness of the plans or protocols being tested.

Appendix E

Potential Crisis Management Incidents

The following are examples of the types of incidents which could serve as the basis for developing an emergency action plan, a response plan, and a continuity plan as well as an exercise to test the effectiveness of those plans.

Attack: A hostile (cyber or physical) action aimed at disrupting or destroying operational capability and/or causing significant damage to the facility.

Breach or Failure: Any condition characterized by total or partial loss of the capability to impound water.

Controlled Breach: Planned (non-emergency) breach of an impounding structure, possibly carried out to remove the facility from service or to make major repairs.

Cyber Security Incident: Any denial of service attacks incidents, identification of malicious codes, unauthorized access, and/or inappropriate usage of information systems.

Earthquake: Operations and structural performance are affected by a nearby seismic event.

Emergency Action Plan Activation: Implementation of the emergency action plan (or emergency actions) in part or whole.

Emergency Condition: Any event or circumstance that clearly compromises the structural integrity of the facility and could lead to breach or failure. For example: Water has overtopped a dam or dike.

Equipment Malfunction: Failure of mechanical or electrical equipment to perform the functions for which they were intended.

Excessive Release: Reservoir discharge that exceeds downstream capacity and/or causes downstream damage.

Facility Mis-Operation: Unintentional operator error affecting the operations of the facility.

Lock Closure: Unscheduled or scheduled interruption of partial or total navigation traffic through the facility.

Physical Security Incident: Any breach in access control systems such as fences, doors, gates, locks, and security zones.

Regulatory Action: The regulatory agency has determined an unsafe condition exists, or that the facility does not meet applicable design criteria (e.g., inadequate spillway capacity), and requires action to be taken by the owner (e.g., reservoir restriction, safety modification).

Reservoir Incident: Any event in the reservoir that may impact the structural/functional integrity of the facility. For example: Landslides.

Sabotage: A deliberate action aimed at weakening or destroying operational capability through subversion, obstruction, disruption, and/or destruction.

Security Posture Modification: Any change of security activities and protocols in response to specific threat reports.

Significant Inflow Flood: Operations and structural performance are affected by significant inflow flood.

Significant Inflow of Ice and Debris: Operations and structural performance are affected by significant inflow of ice and debris.

Structural Modification: Modifications to improve the safety and/or operational characteristics of the facility.

Suspicious Activity: Any indication that surveillance activity (such as elicitation of inappropriate information, suspicious photography, attempted intrusion, steady observation, etc.) could be taking place.

Unsafe Condition: Any developing or occurring event or circumstance that may adversely affect the structural integrity of the facility but that is considered controllable through the appropriate remedial actions. For example: Water level of the reservoir reaching unsafe levels; any developing downstream erosion or settlement; any unusual leakage; etc.

Unsatisfactory Condition Report: The findings of any inspection, assessment, or investigation that identify unsatisfactory or unsafe conditions at the facility.

Unusual Observation: An unusual situation is detected but there is no indication that the structural/functional integrity of the facility may be immediately compromised. For example: Observations of damage, deterioration or signs of distress; instrumentation readings reaching pre-determined limits; signs of piping, slumping, unusual cracks, or sinkholes; any obstruction in the spillway; etc.

Vandalism/Theft: Willful or malicious destruction or defacement of public or private property/ taking and removing of personal property with intent to deprive the rightful owner of it.

Vessel Allision/Collision/Grounding: Any events involving vessel impacts on other vessels, structures or operating equipment at the facility.

Appendix F

In this section, you will log each emergency management exercise or event that occurs.

Type of Exercise/ Incident	Date	AOM Signature

INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION

FLOOD AND EMERGENCY OPERATIONS MANUAL
AMISTAD DAM and POWER PLANT PROJECT

Revised
June 2012

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CHAPTER 1: INTRODUCTION AND GENERAL INFORMATION

FOREWORD

Requirement and Reference

This Flood and Emergency Operations Manual has been prepared to define the United States Section's roles and responsibilities in time of a flood or an emergency at the Amistad Dam and Power Plant Project (the Project); to assure that all personnel of the United States Section know their individual duties and responsibilities; and to assure that flood-fighting activities of the United States Section are coordinated with the responsible Officers of the Mexican Section and of other Federal, State, and local agencies in the United States.

Control

The issuing office for this manual is Operations Department, Operations and Maintenance Division, Amistad Dam Field Office. The contact for questions about this manual is Amistad Area Operations Manager.

Supersession

This manual cancels and supersedes all previous manuals.

Effective Date

This manual becomes effective June 1, 2012.

INTRODUCTION

The Rio Grande from El Paso to the Gulf of Mexico is an international river; therefore, the control of its floods is an international undertaking of the Governments of the United States and Mexico through the International Boundary and Water Commission. Amistad Dam is the second of the international multipurpose storage dams to be constructed on the Rio Grande by the United States and Mexico, in accordance with the 1944 Water Treaty

between the two countries and provides important flood control, water conservation, and recreation benefits.

The Amistad Dam and Reservoir Project (the Project) is located in Val Verde County, Texas, and the State of Coahuila, Mexico, with the dam approximately 12.8 river miles above Del Rio, Texas, and Ciudad Acuña, Coahuila. The United States Section of the International Boundary and Water Commission (US Section) is responsible, under public law 605, 86th Congress, approved July 7, 1960 for the construction and operation and maintenance of the United States portion of Amistad Dam and Reservoir. Also, the US Section is responsible for coordinating with the Mexican Section of the International Boundary and Water Commission (Mexican Section) during Flood Operations to act jointly in making flood releases. The U.S. Section also coordinates its efforts with those of other interested Federal, State and local authorities.

PURPOSE

This Flood and Emergency Operations Manual has been prepared to define the U.S. Sections' roles and responsibilities in times of a flood or emergency at Amistad Dam and Power Plant Project; to assure that all personnel of the U.S. Section know their individual duties and responsibilities; and to coordinate flood fighting and flood monitoring activities of the US Section with the responsible officers of the Mexican Section, and Federal State and local agencies in the United States.

OBJECTIVE

The objective of the U.S. Section is to provide a basis for sound organization and an action program to save lives and properties from Rio Grande floods. This manual defines the following responsibilities for hydrographic operations and dam and power plant operations.

1. Mission
2. Responsible Officer
3. Operations Center
4. Organization
5. Preparatory Requirements Before Flood Season
6. Alert Actions
7. Requirements and Actions During Flood
8. Photographic Coverage
9. Requirements and Actions After Flood

For an Emergency Action, it defines the following responsibilities.

1. Roles and Responsibilities
2. Surveillance
3. Response During Periods of Darkness
4. Response During Weekends and Holidays
5. Response During Periods of Adverse Weather
6. Alternate Systems of Communication
7. Plan Maintenance

MISSION

The Mission of the U.S. Section is to operate the Project jointly with the Mexican Section in order to minimize the loss of lives and properties. In order to carry out this mission, **Responsible Officer** will:

1. Ensure the collection of hydrologic information, provide data and forecasts of the flood and make information available on a timely basis;

2. Ensure the necessary field operations are conducted to provide for the security of all structures;

3. Ensure that flood operations are properly coordinated with Mexico with respect to the Flood Operations Criteria and that releases from Amistad Reservoir provide controlled flood flows in the Rio Grande insofar as possible;

4. Ensure that the Public Affairs Office has access to the pertinent information to provide through public releases. Flood data will be exchanged with other Federal, State and local agencies with notification to the Public Affairs Office; and

5. Ensure that operations and efforts are properly coordinated with affected Federal Agencies, and with State and local authorities.

RESPONSIBLE OFFICER

The person directly responsible for carrying out the mission of the United States Section is the Principal Engineer, Operations Division. He may delegate this authority. He will ensure complete coordination and keep the United States Commissioner fully informed.

ORGANIZATION

IBWC

The organization responsible for coordinating and effecting flood fighting and flood monitoring activities for floods affecting the Amistad Dam Project shall consist of the Amistad Dam Project personnel, and, if needed, designated personnel from the Falcon and Mercedes Field Offices, the El Paso Headquarters Water Accounting Division and O&M Division and such outside forces as the circumstances warrant. The flood emergency operations organization is shown on the chart on the next page.

Insert chart next page as Figure 1.

Roles and Responsibilities of State and Federal Agencies

The roles and responsibilities of various agencies typically involved in high flow or emergency events are briefly described below. In many cases, web sites are listed which describe these agencies in more detail.

Keep Contact Information Confidential

Contact information is also provided herein and on Exhibit D-1. **All telephone numbers should be considered private and unlisted, even those which are not explicitly designated as unlisted, and should not be distributed outside of IBWC without the owners expressed consent**.

River Forecast Center

The West Gulf River Forecast Center (RFC) is in the Southern Region of the National Weather Service (NWS) which is a bureau under the National Oceanic and Atmospheric Administration (NOAA) an agency within the Department of Commerce (DoC) . The West Gulf RFC was founded in September 1961 at Fort Worth, Texas, to assume hydrologic forecast responsibility for the Rio Grande basin and the Texas rivers which drain into the Gulf of Mexico.

A further discussion of the RFC how and why of the warnings are available on the web at http://www.srh.noaa.gov/wgrfc/HMDmain.php. The reader can enter the website at the following address and navigate to the product desired: http://www.srh.noaa.gov/wgrfc. Other forecast website addresses are listed in the text.

IBWC may make estimates of reservoir inflows or downstream flows for its own purposes, but these are not to be provided to the public since they are not official forecasts.

Role

The RFC provides forecasts of reservoir inflows and river flows during floods, generally once a day. During major floods a second forecast per day may be made. The local Weather Service office issues Flash Flood warnings based on local rainfall.

Contacts

While forecasts are generally provided to IBWC, it may be necessary to contact RFC to discuss the forecast at the number below. In order to provide RFC with as much information about current and future flows as possible, IBWC emails each gate change to the RFC at the email addresses in Exhibit D-1. Other staff members and their phone numbers may also be listed in the Exhibit D-1. **These numbers should never be distributed outside of IBWC**.

RFC normal office hours 6 am – 10 pm	Telephone number: 817-831-3289

Hours of Operation

RFC normally operates 8 am to 5 pm weekdays. During heavy rain events, they typically work from 6 am to 10 pm, and generally have someone on call. The telephone numbers at Exhibit D-1 can be used to contact the RFC outside of normal working hours.

How the forecast is made and updated

RFC has a computer model of the Rio Grande (Rio Bravo) basin which it typically runs once a day due to the voluminous data requirements. In major floods, a second forecast later in the day may be provided. The model has a rainfall-runoff component and a river and routing component. Forecasts are developed on a 4 hour time step for each reservoir and for selected gage locations. The forecast can be obtained from their website at http://www.srh.noaa.gov/Fwd.

IBWC releases are an important component for river flow forecasts downstream of their flood control dams so all IBWC actual releases are emailed to RFC as they occur so that the downstream forecasts, and possibly future reservoir inflow forecasts, can be adjusted.

What to do with the forecast

RFC forecasts are valuable for 'what if' scenarios and are a component of the decision-making process for IBWC gate operations. However, IBWC makes releases based on reservoir capacity and inflows and **not** the forecasts of the RFC.

National Weather Service

The National Weather Service (NWS) is a bureau under the National Oceanic and Atmospheric Administration (NOAA) an agency within the Department of Commerce (DoC) . The RFC is a component of the NWS.

Role

In addition to its weather monitoring and forecasting duties, the NWS meteorologists provide Flash Flood Warnings in response to heavy localized flooding. These warnings can be obtained at http://www.srh.noaa.gov/fwd/ and may be used to estimate reservoir inflows due to localized heavy rainfall.

A future area of direct interaction between IBWC and NWS may be IBWC's utilization of the NWS Doppler radar estimates of areal rainfall. IBWC could obtain the electronic data file consisting of the estimated rainfall in each pixel each 15 minutes. These data may be aggregated into whatever time period desired. These data are plotted for a quick visual estimate of the amount of areal rainfall in a given time period.

While the current primary purpose of this data is a pictorial representation of areal rainfall, IBWC is investigating the use of these data to produce rainfall-runoff estimates.

The NWS and WGRFC have created a Hydrologic Decision Support Map, a web interface tool that allows stakeholders to overlay spatial data layers onto a Google Map. This support tool allows stakeholders the ability to create customized maps that can be utilized during flood and emergency situations. This tool can be found at www.srh.noaa.gov/wgrfc. Routine daily forecasts from the WGRFC can be found at www.srh.noaa.gov/wgrfc/wgrfclegacy.php.

Department of Homeland Security

The U.S. Department of Homeland Security Homeland Security is a single, integrated agency focused on protecting the American people and their homeland from numerous potential threats. Its website is http://www.dhs.gov/index.shtm.

Dams are frequently a terrorist target due to the damage a dam break can cause to people, buildings and lands along a river and the more widespread damage inherent in disruption to public water supplies.

Established protocol requires IBWC to work through local law enforcement agencies in the event of a potential threat. IBWC should not contact Homeland Security directly.

Federal Emergency Management Agency

The Federal Emergency Management (FEMA) Directorate of the U.S. Department of Homeland Security prepares the nation for hazards, manages Federal response and recovery efforts following any national incident, and administers the National Flood Insurance Program.

IBWC will not normally contact the Federal Emergency Management Agency directly. There is an established protocol by which the federal agency is contacted through the State Department of Public Safety. Local governmental agencies are authorized to request help from the DPS, which may contact FEMA if DPS deems it appropriate.

State Emergency Manager

In the event of an emergency or disaster the State of Texas Department of Public Safety Division of Emergency Management (TDEM) manages the local and state governments' response to mitigate the emergency. During a major emergency the TDEM activates the State Operations Center (SOC), which "serves as the states warning point and primary state direction and control facility. It operates 24/7 to monitor threats, make notifications of threats and provide information on emergency incidents to local, state, and federal officials, and coordinate state emergency assistance to local governments that have experienced an emergency situation that local response resources are inadequate to deal with" (http://www.txdps.state.tx.us/dem/Operations/index/htm).

During flood operations the USIBWC exchanges pertinent flood operation

information, i.e. water releases, travel times, with the Emergency Manager of the SOC. In the event that the USIBWC requires emergency assistance/equipment from the SOC, the IBWC will contact the Emergency Manager of the SOC.

District Coordinator

The District Coordinator assists the Chair of the Disaster District in conducting emergency operations. The District Coordinator is the liaison between TDEM and local governments and state agencies during the implementation of emergency responses.

County Emergency Manager

Counties maintain an emergency management program or participate in a local inter-jurisdictional emergency management program to protect lives and property within the county from man-made or natural disasters. The county emergency manager, under the administrative direction of the county judge, manages the response to disasters and emergencies. They convey flood notifications, warnings, and alerts to the public. The county manager also activates and supervises the county Emergency Operations Center, coordinates with local and city officials, and develops a restoration plan in the event of a disaster. If local resources are inadequate to direct emergency activities the county can request assistance from the Disaster District. The Disaster District provides resources to local counties that have inadequate response resources.

CHAPTER 2: HYDROGRAPHIC FLOOD OPERATIONS

MISSION:

To minimize loss of lives and prevent property damage by:

a) Securing and analyzing weather, stream flow and reservoir data necessary for flood forecasts and operations;

b) Providing advance information on the projected flood conditions for the flood forecasts and operations of Falcon Dam; and

c) Documenting the flood conditions for future flood control planning and flood regulation.

RESPONSIBLE OFFICER:

Area Operations Manager, Amistad Dam, is the Responsible Officer for hydrographic flood operations, and reports to the Chief, Operations and Maintenance Division, who reports to the Principle Engineer, Operations Division.

OPERATIONS CENTER:

The Amistad Dam Flood Center will be located at the Amistad Dam Field Office.

The Amistad Area Operations Manager or the designated representative will direct and receive all stage and measurement data from the field hydrographic teams, check collected data against tabulated and developed rating curves and plot discharge hydrographs for all river and tributary gaging stations. Contact will be maintained with the Mexican Section to receive data pertaining to Mexico's river and tributary flows and reservoir release data.

If the flood event requires continual supervision, the Amistad Dam Flood Center will be activated for continuous 24 hour operations. Duties and responsibilities will conform to the tables at Exhibits B-1 and B-2 of this manual. The person responsible for Project and Flood Release Supervision on the second shift shall make the decision as to whether to confer with the Area Operations Manager or to assume those duties without consultation. Work shifts will run from 0600 to 1800 and from1800 to 0600 project time.

ORGANIZATION:

a) Field Hydrographic Teams: Hydrographic measuring teams will be organized from Amistad personnel and other project personnel, if so determined necessary. Exhibits A-1 and A-2 list these teams and the equipment to be carried by each team. These teams will be directed by the Amistad Area Operations Manager at the Amistad Dam Field Office. .

b) Communications: Transmission of data will be by the fastest and most reliable method. All available mobile radio units and cellular telephones shall be used to cover the maximum flood area. Reporting of river tributary, and reservoir stages shall be done on hourly intervals unless otherwise directed. See Exhibit A-4 for water stage gages and stage recording stations.

PREPARATORY REQUIREMENTS BEFORE FLOOD SEASON:

Actions to be taken prior to May 15th of each year:

a) Contact the National Weather Service Offices in New Braunfels and Fort Worth to make arrangements for exchange of data and coordination of forecasts.

b) Inspect and place in proper operating condition all gaging stations and measuring facilities.

c) Check and service communication equipment.

i. Emergency power supply units
ii. Auxiliary mobile and base radio units
iii. Remote stage transmitting systems
iv. Cellular telephones, battery chargers, auxiliary adapters

d) Check and service stream gaging equipment.
i. Bridge and cableway station markings
ii. Sounding weights and sounding reels
iii. Aquacalcs
iv. Sounding cranes and counter weights
v. High water markers (stakes)
vi. M-9 and phone
vii. Additional Hydro equipment needed:

1. Current Meter and rating table
2. Bottled water and food
3. Field note forms (IBWC-5WP-Rev. 10-15-62), Stop watches, and Field note holder
4. Miscellaneous accessories, lights, batteries, and tools
5. Ensure that copies of all rating curves, forecast charts, procedures and replacement parts.

e) Check and service safety equipment:
   i. Personal flotation devices
   ii. Cable cutters
   iii. Rescue beacons

ALERT ACTIONS:

Whenever a tropical depression, storm, or hurricane is within 100 miles (161 kilometers) of the Rio Grande watershed, or when rainfall is forecasted or reported to be occurring in sufficient quantity to produce a major flood above Amistad Dam, or the reservoir rises by 0.3 meters in a 3-hour period, the Amistad Area Operations Manager will alert all hydrographic personnel. The duties of the AOM include:

a) Make assignments to Field Hydrographic Teams and hydrographic personnel within the Rio Grande Watershed upstream and downstream of Amistad Dam. If the anticipated data collection effort at the Project requires more hydrographic personnel than are available on the Project, the Area Operations Manager shall immediately consult with the Chief, Water Accounting Division to discuss the hydrographic efforts. The Chief, Water Accounting Division shall review the emergency conditions, and consult with the Principle Engineer O&M to coordinate the temporary movement of sufficient hydrographic personnel to safely accomplish field hydrographic operations in compliance with the Amistad Dam Project flood operations.

b) Obtain and analyze all hydrographic data and provide the Amistad Dam Flood Center, Lower Rio Grande Flood Control Project Flood Center, and the WAD in Headquarters with river flow forecasts and status of river, reservoir and rainfall conditions.

c) Maintain all hydrographic data in suitable form within the Amistad Dam Flood Center on a current basis to enable accurate reports.

d) Check communications equipment.

e) Have hydrographers check measuring and related equipment while monitoring the flood.

f) Check the condition of all vehicles and boats, addressing, to the extent possible, any maintenance issue.

g) Make all other necessary arrangements for actions during floods.

***REQUIREMENTS AND ACTIONS DURING FLOOD*:**

a) River stages, reservoir levels, releases, and rainfall data as observed and collected in the field, will be relayed as soon as possible to the Amistad Dam Flood Center.

b) The Power Controller in charge at the Amistad Dam Flood Center will compute hourly inflows, three hour inflows and maintain the Amistad Flood Release Calculations table and report to the Power Production Manager, who keeps the Area Operations Manager, Amistad Dam informed as necessary.

c) Communications - to be the fastest and most reliable available means (cellular telephone, telephone, radio, or fax).

d) Field flow measurement data are to be transmitted directly to the Amistad Dam Flood Center where all data will be recorded on proper forms and relayed to Headquarters WAD.

e) Stage and/or discharge hydrographs are to be kept current for analyzing, comparing, and forecast purposes. See Exhibit A-4 for gaging stations used for forecasting purposes.

f) The Amistad Area Operations Manager will prepare, review, and coordinate river forecasts with the National Weather Service every three hours or sooner, if necessary.

g) Flood information and river forecasts are to be logged and transmitted as required by the Area Operations Manage*r* to each of the following:

1) WAD, El Paso
2) National Weather Service in New Braunfels and Fort Worth

3) IBWC, Mexican Section at Ciudad Acuña

h) Field hydrographic teams will stake high water marks at the time of the peak stage, or shortly thereafter, at each point, if possible. High water marks should be established near bridge structures, gaging stations and landmarks along the river.

i) The Chief of Operations and Maintenance Division will arrange for a flood damage survey, if necessary.

j) Reports of unusual discharges into the river such as untreated effluent or spills of industrial hazardous waste products should be reported and documented with photographs and a written description to the Principle Engineer, Operations Division at the end of the day.

k) Adhere to safety procedures as outlined by OSHA regulations to prevent accidents and injuries.

PHOTOGRAPHIC COVERAGE:

During floods, the Chief of Operations and Maintenance Division will determine, in consultation with the Principal Engineer, Operations Division, the extent of aerial photographic coverage necessary and will make arrangements for securing such documentary evidence to include oblique as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special reports should be taken by Commission personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

REQUIREMENTS AND ACTIONS AFTER FLOOD:

a) Elevations and locations of high water marks will be documented by survey crews as soon as possible before the marks are destroyed.

1) Obtain several high water marks (HWM's) to substantiate the validity of the high water profile.

2) Avoid determination of a water level from a questionable HWM with respect to its representing the true water surface.

3) Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.

4) Indicate the nature of the HWMs used such as, dirt and/or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b) Review of the HWMs will be expedited by the Amistad Dam Flood Center so that questionable elevations can be field checked before marks are destroyed.

c) A final and comprehensive damage report will be prepared with the assistance of the Corps of Engineers, if so requested, in accordance with **LETTER OF AGREEMENT** with that Agency dated September 12, 1968 (see Appendix F-5).

d) The Operations and Maintenance Division will prepare a final report of the flood from the beginning to the end with critical and constructive suggestions for future reference and guidance.

CHAPTER 3: DAM SAFETY, GATES AND POWER HOUSE FLOOD OPERATIONS

MISSION:

To minimize loss of lives, prevent property damage, protect the dam and power house and maximize the utilization of floodwaters for the production of hydroelectricity by:

a) Ensuring the safe and effective operation of the 16 Tainter gates in order to safely pass flood waters;

b) Monitoring the dam structure for signs of distress and mitigating all negative impacts to the fullest extent possible utilizing IBWC personnel and/or contractors and rented equipment if necessary;

c) Releasing flood waters, to the extent possible, through the US and Mexican hydroelectric power plants; and

d) Maintaining close cooperation with IBWC Headquarters personnel, Mexican IBWC authorities, and US federal, state and local public service and warning agencies.

RESPONSIBLE OFFICER:

Area Operations Manager, Amistad Dam is the Responsible Officer, and reports to the Chief of Operations and Maintenance Division, who reports to the Principle Engineer, Operations Division.

Releases will be made through the Power House turbines to the extent possible. Power House operations and coordination with CILA are directed by the Power Production Manager.

OPERATIONS CENTER:

The Amistad Dam Flood Center will be located at the Amistad Dam Field Office.

The Amistad Area Operations Manager will direct and receive all stage and

measurement data from the field hydrographic teams, check collected data against tabulated and developed rating curves and plot discharge hydrographs for all river and tributary gauging stations. Contact will be maintained with the Mexican Section to receive data pertaining to Mexico's river and tributary flows and reservoir release data.

If the flood event requires continual supervision, the Amistad Dam Flood Center will be activated for continuous 24 hour operations. Duties and responsibilities will conform to the tables at Exhibits B-1 and B-2 of this manual. The person responsible for Project and Flood Release Supervision on the second shift shall make the decision as to whether to confer with the Area Operations Manager to assume those duties without consultation. Shifts will run from 0600 to 1800 and from 1800 to 0600 project time.

ORGANIZATION:

Amistad Dam: Dam Safety, Gates and Power Plant Operations will be organized into the following functions. A more detailed description of the responsibilities of each function is found in Exhibit B-2 below. Functions 2-9 will report to Function 1, Project and Flood Release Supervision.

1. Project and Flood Release Supervision
2. Dam Safety Inspections
3. Communications and Public Notifications
4. Electrical Operations
5. Tainter Gate Operations
6. Mechanical and Electronic Operations
7. Security and Notifications of Public Safety/Warning Agencies
8. Physical Message Delivery
9. Power Plant Operations

PREPARATORY REQUIREMENTS BEFORE FLOOD SEASON:

The following actions are to be taken prior to May 15th of each year.

a) Confirm telephone numbers on all exhibits.

b) Review dam and powerhouse maintenance plans and develop a specific alternate plan should any scheduled outage impact on flood operations.

c) Post Flood Warning Notices at the agreed upon locations.

d) Conduct periodic training on the duties and responsibilities of each organizational function.

ALERT ACTIONS:

Whenever a tropical depression, storm, or hurricane is within 100 miles (161 kilometers) of the Rio Grande watershed, or when rainfall is forecasted or reported to be occurring in sufficient quantity to produce a major flood above Amistad Dam, or the reservoir rises by 0.3 meters in a 3-hour period the Amistad Area Operations Manager will alert all project personnel. Duties of the AOM include:

a) Make assignments to Operations and Maintenance and Power Plant personnel at Amistad Dam. If the anticipated work effort at the Project requires more personnel than are available on the Project, the Area Operations Manager shall immediately consult with the Chief, Operations Division to discuss the anticipated work efforts. If additional staff is needed, the Chief, Operations Division will coordinate the temporary movement of sufficient personnel to safely accomplish field operations in compliance with this manual and other safe industry practices.

b) Check communications equipment.

c) Establish a plan to make space available in the warehouse should power house equipment need to be relocated. If permanently reserved space is not available, the plan will consider relocating existing warehouse materials to a location that will not hinder further flood operations.

d) Make all other necessary arrangements for actions during floods.

REQUIREMENTS AND ACTIONS DURING FLOOD:

Nine functions, in addition to the hydrographic function, have been identified as necessary for successful flood operations. These functions are identified below.

1. Project and Flood Release Supervision

2. Dam Safety Inspections
3. Communications and Public Notifications
4. Electrical Operations
5. Tainter Gate Operations
6. Mechanical and Electronic Communications Operations
7. Security and Notifications of Public Safety/Warning Agencies
8. Physical Message Delivery
9. Power Plant Operations

If the flood event requires continual supervision, the Amistad Dam Flood Center will be activated for continuous 24 hour operations. The person responsible for Project and Flood Release Supervision on the second shift shall make the decision as to whether to confer with the Area Operations Manager to assume those duties without consultation. Shifts will run from 0600 to 1800 and from1800 to 0600 project time. Personnel assigned to each function and shift are identified in Exhibit C-1.

The Power Plant floods at releases of 1,700 cms. Every consideration will be given to provide as much lead time as possible to allow the relocation of critical Power Plant equipment. It is currently estimated that it will take 4 hours to prepare for flooding of the Power Plant. *Future improvements to this plan will provide additional information on which equipment will be relocated, how and to where it will be relocated and the lead time necessary to successfully relocate it.*

During floods, the Chief, Operations Division will determine in consultation with the Principal Engineer, Operations the extent of aerial photo coverage necessary and make arrangements for securing such documentary evidence to include oblique as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special reports should be taken by Commission personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

Personnel Safety Guidelines (Public and Dam Operators)

It is imperative to operate the gates in a manner which keeps the safety of the people involved at the forefront of operational decisions. The most common factors which affect safety are provided in Exhibit A-1. These are representative only and others factors may be considered as they occur.

Dam Safety Guidelines

The first rule of safe dam operations is to keep the water where it was designed to be, and keep it away from areas it was not designed to be.

Moving water, such as releases through the gates of a dam, represents a large amount of energy. A dam and its associated structures are designed (to the extent the designer plans) to withstand the effects of moving water. Water flowing in locations that are not designed to withstand its effects can cause severe erosion and/or mechanical failure of the dam and structure. See Exhibit A-2.

Signs of Distress

It is unlikely that any of these signs will ever be present. However, should the Project Personnel ever notice situations described, refer to Section 3 of this Manual, the Emergency Action Plan. The Signs of Distress is provided in Exhibit C-8.

Streambed/stream Bank Safety

The major concern for the streambed is erosion, either immediately below the dam or further downstream. The actions described in Exhibit A-2 provide ways to limit erosion immediately below the dam. The actions described in Exhibit A-3 will help protect the streambed further downstream. In general, as velocity rises, so does the amount and size of the material that can be moved. It is impossible to make gate releases without increasing the velocity of the water to some degree. The guidelines below help by reducing the change in velocity.

Operational and Computational Guidelines

Desire 'Full' Reservoir at the end of High Flow Situation

The ability of the reservoirs to provide water supply was determined based on the historical drought of record. The Rio Grande (Rio Bravo) basin has historically had long periods of very dry weather, and new droughts of record have recently been set state-wide. Since the end of any high flow event could be the start of a new drought, at end of a high flow event, the IBWC reservoir should be 'full' in order to preserve its ability to meet its water supply commitments.

What constitutes a 'full' reservoir can be a matter of professional judgment but, in general, the lake should be at the top of the normal level of the conservation pool. The normal level of the pool may vary depending on the current and projected water supply demands and operational conditions at the dam. Currently, Amistad Lake is considered full at 340.460 m (1117.0 ft msl). An explanation of level pool routing can be found in Exhibit A-4.

FLOOD OPERATION CRITERIA

The U.S. and Mexican Sections have agreed on the Flood Operation Criteria to be used to determine flood releases. These Criteria are designed to minimize flood damage and to ensure the safety of the dam.

In general:

a.) During the rising limb of the flood hydrograph, flood operations shall be scheduled so that releases will not exceed the flood discharge which would have occurred without the Amistad Project and

b.) Releases from Amistad shall take into consideration the availability or storage capacity within Amistad and Falcon reservoirs, existing and forecasted weather conditions, inflows into the reservoirs and downstream river conditions.

The specific criteria and associated charts are included as Exhibit C-3.

The normal process of coordination and determination of the release shall be made by the party responsible for Function 1, above, as follows.

a.) The Water Accounting Division (WAD) Chief gathers data and will relay the information to the Operations and Maintenance Chief and others as may be designated.

b.) The USIBWC O&M Division Chief in consultation with the WAD and Mexican Section Representative, will develop a recommendation to the Principle Engineer of Operations on release actions.

c.) The Principle Engineer, Operations, will consult with the USIBWC Commissioner. It is anticipated that the Commissioners for the U.S.

and Mexican Sections will communicate with each other and provide a final recommendation on gate operations.

d.) The Principle Engineer, Operations, shall relay the final decision on releases to the Chief's of Operations and Maintenance and WAD.

e.) O&M Chief will relay required actions to the Project.

f.) The Project will confer with his Mexican Section counterpart and coordinate to carry out the approved release decision.

The coordination required for a gate release assumes open lines of communication within and between the two countries and their respective agents. There are numerous communication networks that can be employed for this communication: telephone land lines, cell telephones, radios, satellite telephones (See Exhibit E-2***)*** and potentially even physical meetings. However, should all these methods of communication be inoperable, the Area Operations Manager will implement any actions necessary, in his professional opinion, to make releases for dam safety purposes while continually attempting to reestablish communications.

REQUIREMENTS AND ACTIONS AFTER FLOOD:

a) A final and comprehensive damage report will be prepared with the assistance of the Corps of Engineers, if so requested, in accordance with **LETTER OF AGREEMENT** with that Agency dated September 12, 1968 (see Appendix G-5).

b) The Operations and Maintenance Division will prepare a final report of the flood from the beginning to the end with critical and constructive suggestions for future reference and guidance.

CHAPTER 4: EMERGENCY ACTION PLAN

EAP BEGINS ON THE NEXT PAGE

5 U.S.C. 552(B)(7)(E) AND (F)

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

FLOOD EMERGENCY OPERATIONS MANUAL
PRESIDIO PROJECT

Edward Drusina, United States Commissioner
May 2012

Volume III
Chapter M719
Handbook M719

Table of Contents

Exhibit's Table of Contents

FOREWORD

A. Requirement and Reference

This Flood Emergency Operations Manual has been prepared to define the United States Section's roles and responsibilities in time of flood; to assure that all personnel of the United States Section know their individual duties and responsibilities; and to assure that flood-fighting activities of the United States Section are coordinated with the responsible officers of the Mexican Section, and of other Federal, Stated and local agencies in the United States.

B. Control

The issuing office for the manual is Operations Department, Operations and Maintenance Division, Presidio Project. The contact for questions about this manual is Presidio Area Operation Supervisor.

C. Supersession

This manual cancels and supersedes all previous manuals.

D. Effective Date

This manual becomes effective May 15, 2011.

FLOOD EMERGENCY OPERATIONS MANUAL
PRESIDIO FLOOD CONTROL PROJECT

INTRODUCTION

The Rio Grande from El Paso to the Gulf of Mexico is an international river; therefore, the control of its floods is an international undertaking of the Governments of the United States and Mexico through the International Boundary and Water Commission.

Presidio Project area of jurisdiction extends along the Rio Grande from Tri-County line (river kilometers 1759.54 Presidio-Hudspeth-Jeff Davis County line) to Heath Canyon, Texas (river kilometers 1250.13 La Linda Hwy. Bridge 509.41 river kilometers). The Presidio Project includes part of the Boundary Preservation Project, eight gaging stations, four creeks, one diversion dam, and the Presidio Flood Control Project.

The Presidio Boundary Preservation Project is located from Tri-County line to Haciendita station. Both governments, the United States and Mexico agreed on December 26, 1979 (Minute 262) upon review the 1970 Treaty to preserve the Rio Grande's character as the International Boundary. The Commission also agreed to improve the lands by implementing a restoration of vegetation plan, maintain a clear berm of 100ft on each bank from the international boundary with the exception of 25ft of natural vegetation along each bank, and prohibit the construction of works that may cause deflection or obstruction of the normal or flood flows of the river.

Due to the nature of floods on the Rio Grande The Presidio Flood Control Project extends along the Rio Grande from Haciendita (Levee Station 0+00) to Brito Creek (Levee Station 21+213.00) a distance of 15.2 miles**,** with two spur levees for the Cibolo and Brito Creeks. The control of floods is the responsibility of the International Boundary and Water Commission, United States and Mexican Sections. Jointly the Flood Control Project is coordinated by an international agreement. The United States Section of the Commission is required by law for construction and operation of works authorized for protection of life and property from Rio Grande floods. Also the United States Section is responsible for coordinating, reporting and exchanging of data with the Mexican Section; and for patrolling during flood periods the levees and appurtenant works of the United States. The United States Section coordinates its effort with those of other Federal, State, and local authorities.

P U R P O S E

This Flood Emergency Operations Manual has been prepared to define the International Boundary and Water Commission United States Section's functions and responsibilities in time of flood**.** In addition to assure that the Presidio Project Personnel carry out the flood-fighting activities in an efficient manner that protects lives and property while coordinating with the International Boundary and Water Commission Mexican Section, and other Federal, State, and local authorities.

OBJECTIVE

The objective of the U.S. Section is to provide a basis for a sound organizational plan with an action program to save lives and properties form Rio Grande floods. For this purpose, this manual defines:

1. Mission
2. Responsible Officer
3. Operations Center
4. Organization
5. Preparatory Requirements before Flood Season
6. Alert Actions
7. Requirements and Actions during Flood
8. Photographic Coverage
9. Requirements and Actions after Flood

MISSION

The USIBWC mission is to provide environmentally, sensitive, timely, and fiscally-responsible boundary and water services along the United States and Mexico border region. We pledge to provide these services in an atmosphere of binational cooperation and in a manner responsive to public concerns. By performing throughout the levee system maintenance and flood monitoring through the following:

1. Ensure the collection of hydrographic data, dissemination of that information, and provides forecasts of floods.

2. Ensure that the necessary field operations are conducted to assure the security of levees and proper operation of structures in the floodplain.

3. Ensure that flood operations in the international reach of the Rio Grande are properly coordinated with the Mexican Section of the Commission.

4. Ensure that the Public Affairs Office provides pertinent information through public releases. Flood operation efforts will be properly coordinated with other U.S. Federal, State, and Local agencies.

RESPONSIBLE OFFICER

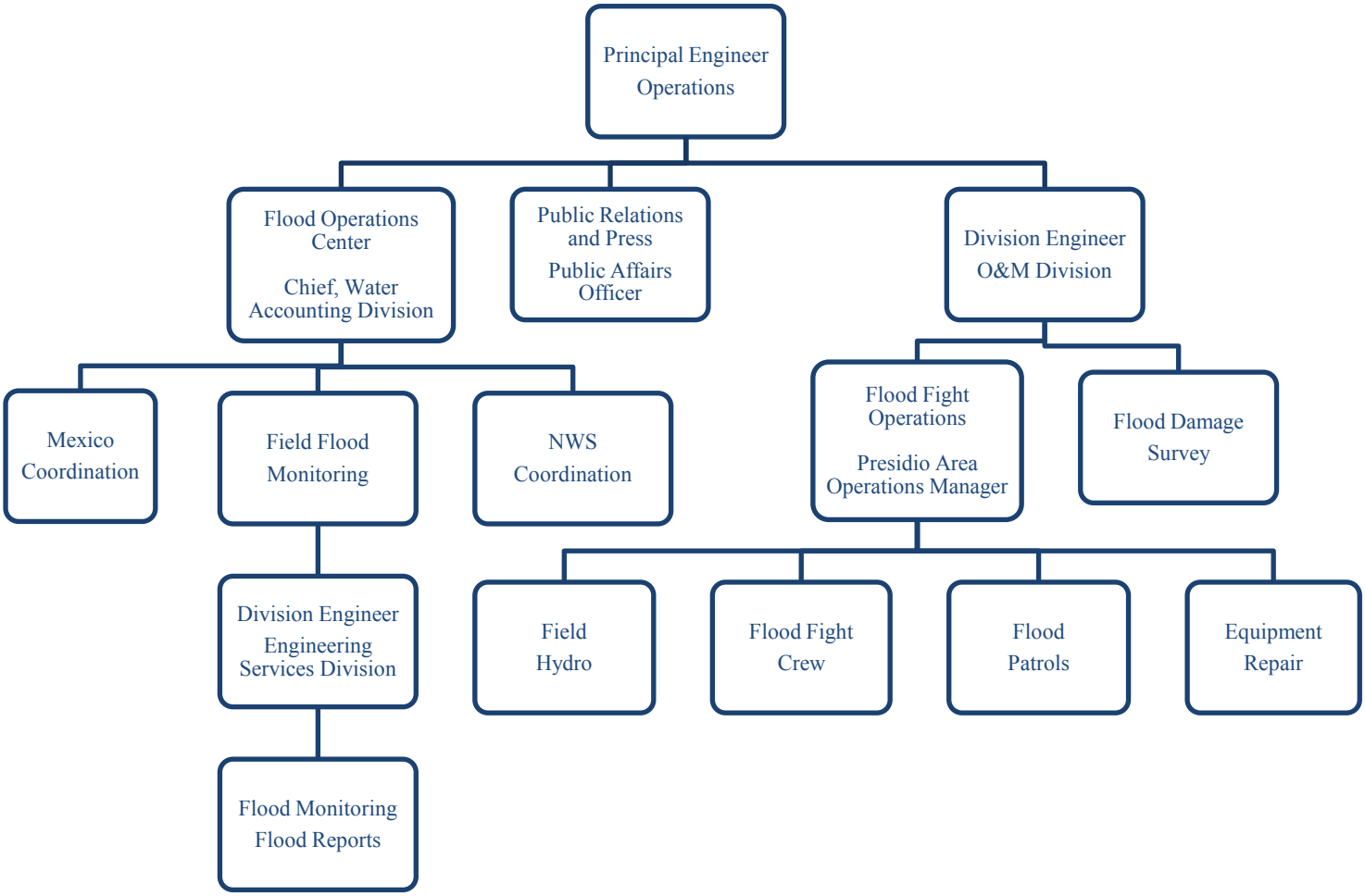
The person directly responsible for carrying out the mission of the United States Section is the Principal Engineer of the Operations Department or his assigned deputy, Division Engineer of Operation and Maintenance Division. They will ensure complete coordination and keep the United States Commissioner fully informed.

ORGANIZATION

The organization responsible for coordinating and executing flood fight activity within the Presidio Project consist of the Presidio Project personnel and designated personnel from the U.S. Section Headquarters in El Paso, Texas. The Presidio Project Supervisor is responsible for coordinating flood fight activity which, consists of organizing personnel and obtaining assistance as the circumstances warrant. The Flood Emergency Organizational Chart is shown on the following page.

Presidio Project

Flood Emergency Organizational Chart



PART A
HYDROGRAPHIC FLOOD OPERATIONS

1. Mission: To minimize the loss of lives and property by:

    a. Securing and analyzing weather and stream flow data necessary for flood forecasts and operations.
    b. Providing advance information on the projected flood conditions; and
    c. Documenting the flood conditions for future flood control planning and flood regulation.

2. Responsible Officer: The Chief Water Accounting Division (WAD) is the responsible officer for hydrographic flood operations and reports to the Division Engineer of Operations and Maintenance (O&M).

- a. Division Engineer of Operation and Maintenance (O&M) Division will be the head of the Emergency Operation Center (EOC) and will be responsible for flood fight activities that include monitoring of flood, the development of all flood reports, public relations, and facilitate purchasing and acquisition of needed emergency fighting equipment and supplies. The O&M Division Engineer will keep the O&M Principal Engineer fully informed of flood activities.

b. Chief of Water Accounting Division (WAD) is responsible for coordinating with MXIBWC (CILA) to exchange flood data, coordinate with the US National Weather Service (NWS) on weather forecasts, and acquire rainfall data and current meter measurements from the Presidio Project. Data will be gathered and analyzed to project flood conditions such as time of the expected peak(s) and peak flows at principal gaging stations.

c. Presidio Project will responsible to carry out flood fight activities, collect rainfall and perform current meter measurements, and maintain the EOC updated.

3. Emergency Operations Center (EOC): During the occurrence of a flood on the Rio Grande between Tri – County Line to Heath Canyon, Texas the United States Section Flood Center will be established in the Operation & Maintenance Division at US Section Headquarters in El Paso, Texas. The head of the EOC will be Division Engineer of O&M and is responsible of coordinating with the Public Affairs Office, Acquisitions department, Chief of WAD that will be responsible for acquiring all hydrologic data to tabulate and develop rating curves for all Presidio river gaging stations, and Presidio Project Office. To coordinate appropriate course of action to collect Flood Data and arrange immediate activation of personnel and equipment**.** If the flood event requires continual supervision the EOC will be activated for continuous 24 hours operations.

4. Organization:

    a. *Field Hydrographic Teams:* Presidio Project hydrographic team consists of Presidio's Hydro Technician and Hydro Technician Aide. Other field hydrographic teams will be organized and brought to the Presidio Project as circumstances warrant. These teams will be directed by Presidio Project Supervisor and will be based at locations accessible to all gaging stations. United States Section Hydrographic Personnel is listed below:

        1. Headquarters - Supervisory Hydrologist
        2. Headquarters - Hydrologists
        3. American Dam - Hydro Technician
        4. Presidio - Hydro Technician
        5. Presidio - Hydro Technician Aide

6. Amistad - Hydro Technicians
7. Falcon - Hydro Technicians
8. Mercedes - Hydro Technicians

b. *Field Data Collection Personnel:* Field data collection personnel will be organized from the Presidio Project personnel and other United States Section personnel, as circumstances warrant. Field Data Collection Personnel is listed below:

Measuring Team:	Hydro Technicians
	Hydro Technicians Aide
Clerical Support:	Administrative Service Clerk
Field Support:	Presidio Project Supervisor
WAD:	Supervisory Hydrologist
	Hydrologists
EOC:	Division Engineer of O&M

c. *Communication:*
   1. During floods the Presidio Project Supervisor in consultation with the Division Engineer of O&M will appoint a liasion to makes arrangements for securing such documentary evidence such as photographs and communicating with local EOC personnel.

   2. Transmission of data will be by the fastest and most reliable method. All available mobile radio units shall be used to cover the maximum flood area. Use of telephone will be made in the absence of radio communications. Reporting of river stages shall be done on hourly intervals unless otherwise directed. See **Exhibit 3** for water gages and recording stations.

5. <u>Preparatory Requirements Before Flood Season</u>: Action to be taken prior to May 15th of each year.

a. Contact National Weather Service Offices, Midland, Texas to make arrangements for exchange of data and coordination of forecasts. See **Exhibit 9** for the agency responsibilities per the MOU.

b. Maintain contact with CILA year round to exchange daily information concerning the Rio Grande, Rio Conchos, and Luis Leon (Granero) Dam.

c. Throughout the year maintain contact with CONAGUA concerting levee system projects and receiving updates of the Rio Conchos Dams.

d. Inspect and place in proper operating condition all gaging stations and measuring facilities.

e. Check and service communication and electrical equipment:

   1. Emergency power supply units.
   2. Auxiliary mobile and base radio units.
   3. Remote stage transmitting systems.
   4. Cellular telephones, battery chargers, and car adapters
   5. Personal Protection Equipment (PPE)

f. Check and service measuring equipment:

2	Aquacalcs
1	Mobile Radio in pickup truck
2	Current meters with rating and vertical angle correction tables
3	Sounding weights - 50C, 75C, and 100E
1	Type “A” Crane (attached to 4-wheel base as available)

1 B-50 Reel
1 Plug-in floodlite, 12 volt
1 Flashing lantern and spotlight
1 Water can, emergency rations

Necessary tools, measurement note blanks, Personal Protective Equipment, boots, tag lines, raincoats, wading equipment, miscellaneous accessories, repair and replacement parts, etc. Power winch equipment, and/or boat and boat measuring equipment to be added in accordance with needs.

g. Check and service motor boat and boat equipment:

1. All pickups are to be equipped with standard size ball hitch.
2. All boat trailers are to be standardized for hook-up.
3. Boats designated for flood use shall be a minimum 12 feet in length, be equipped with at lease at 14 H.P. motor, and carry the following equipment:
   a. Boat tag-line and measuring boom
      3 - life preservers
      2 oars and 1 anchor
4. Tool box with extra propeller, shear pins and other motor accessories, flagging, range finder, etc.

It shall be the responsibility of an experienced supervisor to determine the feasibility and safety concerning operation of a boat in streams at floodstage taking into account the velocity, debris, experience of boatmen, etc.

6. Alert Actions: When weather forecast and Rio Grande's flows are of such magnitude that flooding is occurring or imminent the Division Engineer of O&M notifies the Principal Engineer of O&M, establish him/herself at the Flood Operation Center at the Operation and Maintenance (O&M) Division Office, and alert the Presidio Project Supervisor who will mobilize Presidio Project's personnel and equipment.

The Chief of Water Accounting Division shall:

a. Obtain and analyze all hydrographic data and provide the Presidio Project Supervisor with river flow forecasts developed by NWS and status of all river and rainfall conditions. Keep the Division Engineer of O&M, fully informed of all conditions and data.
b. Maintain all hydrographic data in suitable form within the flood operations center on a current basis to enable understandable situation reports.
c. Contact National Weather Service in Midland, Texas exchange meteorological data, flow measurements, and flood forecasts.
d. Alert the Mexican Section.

The Presidio Project Supervisor shall:

a. Assemble and make assignments to Field Data Collection and Hydrographic personnel who will proceed to assigned project areas.
b. Check all communications equipment.
c. Have hydrographers check measuring and related equipment while monitoring flood conditions.
d. Alert the City of Presidio, Border Patrol, County Judge, Port of Entry, and DHS will be contacted by USIBWC Headquarters.
e. Make all arrangements necessary for actions during floods.

7. Requirements and Actions during Flood:

a. Stage data is observed and collected in the field, it will be relayed as soon as possible to the EOC with any other new river stages, discharge and rainfall data.

b. Maintain daily or hourly contact if possible with CILA and exchange Rio Conchos information and Rio Conchos Dams information. (Luis L. Leon (Granero), La Baoquilla, and Madero Dam)

c. Contact CONAGUA concerning levee system updates, dam updates, and receive hourly updates of the Rio Conchos Dams level readings(Luis L. Leon (Granero), La Baoquilla, and Madero Dam).

b. Communications are to be fastest available means (telephone, cellular phone, fax, or radio).

c. Field measurement data are to be transmitted to the EOC in El Paso, Texas where all data will be recorded on proper forms.

d. Stage and/or discharge hydrographs are to be kept current for analyzing, comparing and forecast purposes. See **Exhibit 3** for water stage gages and recording stations used for forecasting purposes.

e. Chief of Water Accounting Division, will prepare, review, and coordinate river forecasts with National Weather Service.

f. The Chief of Water Accounting Division will ensure that flood information and river forecasts are logged and transmitted as necessary to each of the following:

(1) Division Engineer of O&M and Principal Engineer of Operations
(2) National Weather Service, Midland (see **Exhibit 9**)
(3) IBWC, Mexican Section.

g. Stake high-water marks (HWM) <u>at the time of the peak stage</u>, or shortly thereafter, at each point, if possible. High water marks should be established near bridge structures, diversion dams, gaging station, and landmarks along the river and levees.

h. Division Engineer of O&M will arrange for a flood damage survey.

i. Reports of unusual discharges into the river such as, untreated effluent or spills of industrial hazardous waste products should be reported and documented with photographs and a written description to the Principal Engineer of Operations, at the end of the day.

j. Adhere to safety procedures as outlined by OSHA regulations to prevent accidents and injuries.

8. <u>Photographic Coverage</u>:

During floods the Presidio Project Supervisor in consultation with the Division Engineer of O&M will make arrangements for securing such documentary evidence of aerial photo coverage necessary to include obliques as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

9. <u>Requirements and Actions After Flood</u>:

a. Elevations and locations of high water marks (HWMs) will be documented by survey crews as soon as possible before the marks are destroyed.
(1) Obtain several HWMs to substantiate the validity of the high water profile.

(2) Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
(3) Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
(4) Indicate the nature of the HWM used, such as dirt, and/or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b. Review high water profiles as soon as data is available so questionable elevations can be field checked before marks have been destroyed.

c. A final and comprehensive damage report will be prepared, with the assistance of the U.S. Corps of Engineers, if so requested, in accordance with the MOU with that Agency dated November 27, 1990. (See **Exhibit 10**)

d. The Division Engineer of Operations and Maintenance Division will prepare a final report of the flood from beginning to the end with critical and constructive suggestions for future reference and guidance.

e. Continue to have daily contact with CILA to exchange Rio Conchos information and Rio Conchos Dams information. (Luis L. Leon (Granero), La Baoquilla, and Madero Dam)

f. Continue to maintain contact with CONAGUA concerning levee system projects and receiving updates of the Rio Conchos Dams.

PART B

Levee and Structure Maintenance Operations

Mission: To save lives and property:

1. Implementing a flood vigilance and flood fight to ensure the security of the Presidio Project.

2. Maintaining security of United States levees and structures by utilizing Project forces, the employment of contractors, and the use of other agencies' equipment and personnel.

3. Coordinating operations with other United States Federal, State, County, City, and local authorities.

4. Coordinating flood information with Mexico through the responsible engineers of the United States Section and the Mexican Section.

Responsible Officer: The Presidio Project Supervisor is the responsible officer, and reports to the Division Engineer of O&M Division.

Operations Center: The center of all flood operations will be located in the Operations and Maintenance Division at the Headquarters office, United Stated Section, International Boundary and Water Commission. The Flood-Fighting operations center is located at Presidio Project Office.

Organization: See Flood Emergency Organizational Chart (Page 7)

Preparatory Requirements – Before Flood Season: Actions to be taken **prior to June 1st of each year.**

1. Post Flood Warning Notice in local Post Office and ``newspapers. See **Exhibit 11** for an example.
2. Check organization, instructions, supplies, and equipment.
    a. Establish 12-hour shifts with assignments to each employee (see **Exhibit 1, Section A**)
    b. Make personnel assignments and plans to employ additional personnel, if needed.
    c. Check and service communications and electrical equipment.
        i. Auxiliary mobile and base radio units
        ii. Availability of cellular phones
    d. Check equipment and arrange for additional equipment, if needed.
    e. Check supplies, sandbags, and arrange for additional supplies if needed.
    f. Instruct all personnel on flood-fight methods and operations (see **Exhibit 7**)
    g. TRAINING: Periodic classes on gage reading, structure operation, danger signs, and radio communications as well as the 24-hour military time system should be conducted for all patrolpersons. The general instructions for patrolpersons, flood patrols, and flood fighting (see **Exhibit 7 through 9**) will be reviewed and discussed with the patrolpersons. The Presidio Project Supervisor will make certain that each patrolperson knows the sector that he will patrol in the event of a flood. This includes knowing the location and number of gages he will be required to read.
3. Sources of assistance (equipment and men) – check with and obtain from local contractors, water districts, and Border Patrol, a current list of available equipment and personnel for use during flood emergency operation (see **Exhibit 6**)

4. Federal, State, Counties, City, and other local authorities will be contacted and requested to perform the tasks as specifically assigned to them. See **Exhibit 6** for telephone listings.

Alert Actions: During the summer season (June through October) and whenever there has been sustained and repeated rainfall in the contributing Rio Grande watershed, or when rainfall is forecasted or reported to be occurring in sufficient quantity to produce a flood, the Division Engineer of O&M, will declare an **"ALERT",** place all Project personnel on **"STAND-BY ALERT"** status, and:

1. Test emergency generators and communication equipment.
2. Ensure flood supplies are available and ready; check on the availability of additional flood supplies, such as sandbags and sand.
3. As conditions warrant, alert, inform, and discuss the situation and responsibilities with other Federal agencies (National Weather Service, Office of Emergency Planning, Border Patrol, etc.); State agencies (Emergency, Police, Highway); local agencies (County and City); Railroads; and Licensees. Coordinate the closure of any required storm drains and other gated structures which would cause flooding outside of the levee system. See **Exhibits 6** for telephone listings of agencies.

Requirement and Actions during Flood

1. **IBWC, United States Section – Flood Fight Operations**

    a. Operate on two 12-hour shifts, as required (see **Exhibit 1, Section A**)
    b. The Presidio Project Supervisor will determine patrol needs and put patrols in operation in their assigned sections to report in hourly (or more often if required) on (see **Exhibit 4** for Flood Patrol Sectors):
        i. Gage readings along levee (see **Exhibit 3 and 4**)
        ii. Watch for critical sections
            1. Confluence of Rio Conchos and Rio Grande
            2. Cibolo Creek
            3. Railroad
            4. Rubio Bend
            5. Brito Bend
            6. Irrigation and Drain Structures
        iii. Critical problems:
            1. Freeboard
            2. Erosion along levees
            3. Boils or seepage on landside of levee
            4. Erosion at bridges
            5. Structures through levees
    c. Maintenance crews and equipment will stand by as directed by the Presidio Project Supervisor.
    d. Establish sandbagging operations with trucks as needed.
2. Contract Personnel and Equipment. Division Engineer of ONM Division will arrange for contract work through the Acquisition Division.
3. Coordinate flood operations with City of Presidio and assist to extent possible.
4. Time System – when 24-hours per day operations begin, all personnel shall go to a 24-hours military time system, based on local time (see **Exhibit 1, Section A**).
5. All project supervisors will keep log of pertinent events and actions with date, time, location, and description for use in preparing flood reports.

Photographic Coverage

During floods, the Presidio Project Supervisor will determine in consultation with the Division Engineer of O&M Division, the extent of aerial photo coverage necessary and make arrangements for securing such

documentary evidence, to include obliques as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

Requirements and Actions after Flood

1. Elevations and locations of high water marks (HWMs) will be documented by survey crews as soon as possible before the marks are destroyed.
    a. Obtain several HWMs to substantiate the validity of the high water profile.
    b. Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
    c. Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
    d. Indicate the nature of the HWMs used such as dirt, and or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.
2. Review high water profiles as soon as data are available so questionable elevations can be field checked before marks have been destroyed.
3. A final and comprehensive damage report will be prepared, with the assistance of the U.S. Army Corps of Engineers, if so requested, in accordance with the Memorandum of Agreement with that Agency dated November 27, 1990 (see **Exhibit 10**).
4. The Operations and Maintenance Division will prepare a final report of the flood from the beginning to the end with critical and constructive suggestions form future reference and guidance.

EXHIBIT 1
Section A
FIELD DATA COLLECTION TEAMS

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5 U.S.C. 552(B)(7)(E) AND (F)

EXHIBIT 2
EQUIPMENT UTILIZED FIELD DATA COLLECTION TEAM

It is very unlikely that all Field Data Collection Teams will be sent to the field at the same time; however, equipment should be available for at least 2 teams. Each team should be equipped with the following items as furnished by the Presidio Project.

Measuring Equipment:

Quantity	Equipment
1	Vehicle with mobile radio
48	Wooden stakes (24-inches)
2	Cans of irradiant spray paint
1	Flashlight or spotlight and batteries
1	Spool of marking tape
1	Plug-in floodlight
1	Keys for gates on river levees
1	100ft of nylon rope
1	Keys for gages/flood shelters
1	Hip boots or waders
1	Pair of binoculars
1	3lb. Hammer
1	50ft measuring tape
2	Raincoats
2	Rounded shovels
2	Life preserver
1	Notebook
1	Clipboard
2	Pencils or Pens
1	Digital Camera

List of Required Supplies:

Quantity	Supplies
30,000	Sand bags
25	Shovels
5	Spot lights - Plug in - 12 volt
10	Flashlights with batteries
50	Batteries, Size D
1	Light plants, portable, 1-1/2 KW - Complete with Light stands (American Dam)
5	Axes
6	Crescent wrenches - 12"
4	Hammers
10	Screw drivers - flat tip
10	Pliers
5	Log books (1-each patrol sector)
5	Cans, safety, gasoline 5 gal. With flexible spout
2	Cans of non-detergent oil - 30 wt. In quart cans

Presidio Project Equipment Available:

Quantity	Equipment
3	GSA Vehicles - w/ radio
1	Motor Grader
1	Tractor-dozers
1	Tractor-loader, wheeled
2	Pumps, centrifugal - 2" & 4" size
1	Roller, pneumatic, wheeled
1	Flat bed truck
1	Dump truck
1	Water sprinkler truck
1	Backhoe
1	Service Truck Flatbed
1	Excavator

Equipment needed for Flood Fight Activities: This equipment could be needed in addition to the equipment listed above.

Equipment
Power plant, 3000 W
Scrapers
Tractor-Loaders, wheel
Sand bag Machines
Light plants portable complete with light stands
Dump Trucks
Tractor Dozers
Truck-tractor equipped with a 50 ton low boy
Service Truck
Excavators
Motor Grader

EXHIBIT 3
PRESIDIO PROJECT GAGING STATIONS

Station Designation Mile Marker	Location
1038.81	Rio Grande near Candelaria, Texas
963.73	Rio Grande Above Rio Conchos near Presidio, Texas
958.73	Rio Grande at Presidio-Ojinaga Vehicle Bridge
950.14	Alamito Creek near Presidio, Texas
949.76	Rio Grande Below Rio Conchos near Presidio, Texas
944.42	Rio Grande below Mulato Dam
845.23	Terlingua Creek near Terlingua, Texas
868.49	Rio Grande at Johnson Ranch near Castolon

Rio Grande Near Candelaria, Texas Gaging Station

Candelaria Gaging Station
Station Number 08-3712.00

Rio Grande Near Candelaria, Texas Gaging Station

Description:
Cableway, Bubbler gage, DCP with GOES high data rate telemetry, and water stage digital recorder located on the left bank of the Rio Grande at San Antonio Diversion Dam, and river kilometer 1,672, 0.5 river kilometer upstream from Capote Creek. The zero of the gage is 871.11 meters above mean sea level, U.S.C.& G. S. datum.

Location:
Left bank of Rio Grande at San Antonio (Mexican) Diversion, 2.2 miles above Candelaria, Presidio County, Texas 214.1 river miles below American Dam at El Paso, Texas 1038.8 river miles above the Gulf of Mexico.

GPS Coordinates:
Latitude N 30° 10'29"
Longitude W 104° 41'11"

Driving Direction:

- Turn left on O'Reilly street and on Y intersection turn right to North 67
- Pass Cibolo Creek Bridge turn left to FM170 West and drive 45.5 miles on FM 170 West
- After Paved Road ends follow Chispa dirt road and drive 1.9 miles to Capote Creek
- Continue on left hand side road to station and drive .6 miles to Candelaria gaging station

Records:
Records are based on 24 current-meter measurements during the year with a continuous record of gage heights and computations by shifting control methods.
Records available: November 19, 1975 through present

Remarks:
Reservoirs, diversions, and drainage returns modify the flow at this station. Prior to June 1979 the zero of the gage was 871.07 meters above mean sea level, U. S. C. & G. S. datum.

Extreme Flows From Records:
Maximum flows were of 561cms on September 30, 1978 with a gage height of 3.310 meters and with a minimum of frequently no flow.

Datum:	871.16m Above MSL U.S.C & G.S.
Design Flood:	425cms
Type Station:	Special Studies
Equipment:	Cableway, bubbler gage, DCP with GOES high data rate telemetry, and water stage digital recorder

Elevation

Top of Road:	873.9m	Top of River Bank:	875.00m (850cms)
Design Flood:	425cms	Zero Staff Gage:	871.16
	September 30, 1978 (561cms)	Bottom of Low Flow Channel:	871.00m

Cableway

Length:	296 ft	Cable Diameter:	1 3/16 in

Rio Grande Above Rio Conchos Near Presidio, Texas and Ojinaga, Chihuahua, Mexico

Above Gaging Station
Station Number 08-3715.00

Rio Grande Above Rio Conchos Near Presidio, Texas and Ojinaga, Chihuahua, Mexico

Description:
Cableway, bubbler gage, and water-stage recorder (graphic and digital), DCP with GOES high data rate telemetry, and data collection platform located on the left bank, and river kilometer 1,551; 8.0 river kilometers upstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua and 3.8 river kilometers upstream from the confluence with the Rio Conchos. The zero of the gage is 784.29 meters above mean sea level, U. S. C. & G. S. datum.

Location:
Above gaging station is located on the left of bank of Rio Grande 2.4miles above Rio Conchos confluence and 7miles Northeast of Presidio, Texas 290.2miles below American Dam at El Paso, Texas and 963.7miles above the Gulf of Mexico.

GPS Coordinates:
Latitude 29° 36'14"
Longitude 104° 27'06"

Driving Direction:

- Turn left on O'Reilly Street and on Y intersection take right to North 67
- Turn left on FM 170 west after crossing Cibolo Creek and travel 5.2 miles turn left on gate
- Drive 0.9 of a mile on dirt road to Above gaging station

Records:
Records are based on 24 current-meter measurements during the year with a continuous record of gage heights and computations by shifting control methods.
Records available: 1889 through Present

Remarks:
Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection platform is operated in cooperation with the National Weather Service, and relays gage height data upon interrogation by telephone via commercial circuits. Prior to 1978 the zero of the gage was 785.37 meters above mean sea level,U. S. C.& G. S. datum.

Extreme Flows From Records:
Maximum 396cms on June 14, 1905 highest flow recorded since 1924 was 146cms, with a gage height of 3.22 meters, on May 26, 1942 and with a minimum frequently no flow.

Datum:	784.29 MSL U.S.C. & G.S.
Design Flood:	90.6cms
Type Station:	Flood Warming, Treaty Water Accounting
Equipment:	Cableway, bubbler gage, and water-stage recorder (graphic and digital), DCP with GOES high data rate telemetry

Elevation

Top of Levee:	789.30m	Zero Staff Gage:	784.29m
Design Flood:	90.6cms	Bottom of Low Flow Channel:	783.9m
Top of River Bank:	786.59m		

Cableway

Length:	202 ft	Cable Diameter:	1 3/16 in

Rio Grande at Presidio – Ojinaga Vehicle Bridge

Vehicle Bridge Gaging Station
Station Number 08-3740.00

Rio Grande at Presidio – Ojinaga Vehicle Bridge

Description:
Gravity well and graphical water-stage recorder with the DCP with GOES high data rate telemetry located on the downstream side of the highway bridge about 400 meters upstream from its confluence with the Rio Grande, and about 9.7 kilometers southeast of Presidio, Presidio County, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river kilometer 1,529, 13.8 river kilometers downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. Measurements of high flows are made from the highway bridge. The zero of the gage is 771.785 meters above mean sea level U.S.C.&G.S. datum.

Location:
On left bank of Rio Grande, 295.23 river miles below the American Dam at El Paso, Texas, and 958.73 river miles upstream from the Gulf of Mexico. The station is located 0.3miles downstream from the new International Bridge.

GPS Coordinates:
Latitude 29° 33'28"
Longitude 104° 23'37"

Driving Direction:

- Turn Left on O'Reilly Street
- Continue on O'Reilly Street
- On Bridge street turn left
- Follow street to old part of Entry
- 1st Gate lock number 2640 continue to 2nd gate near levee, lock number 2640 gage station on levee.

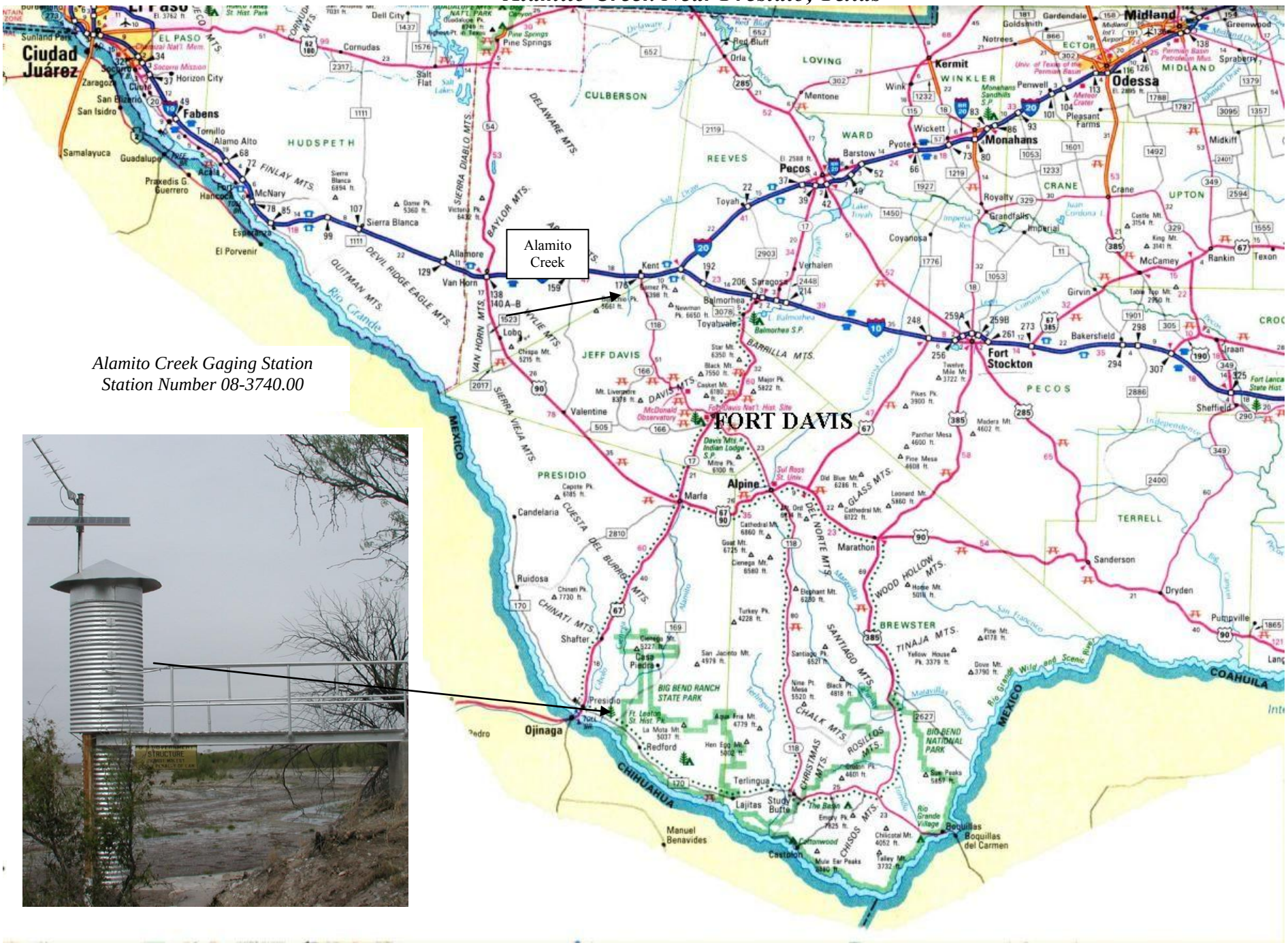
Records:
Records based on 24 current-meter measurements during the year at low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights, and computations by shifting control methods.
Records available: 1932 through present

Remarks:
A small irrigation reservoir (San Esteban) 16.9 kilometers south of Marfa, Presidio County, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Back water from the Rio Grande begins to affect the station record when the flow at the station on the Rio Grande below Rio Conchos reaches about 991 CMS.

Extreme Flows From Records:
Maximum flows were of 1,600 CMS, determined by slope-area calculations on September 2, 1962 with a gage height of 4.130 meters and minimum of no flow occasionally.

Datum:	NGS 777.270 MSL		
Design Flood:	1,190cms		
Type Station:	Flood Warning		
Equipment:	Bubbler gage, and water-stage recorder (graphic and digital), DCP with GOES high data rate telemetry		
		Elevation	
Top of Levee:	788.7m	Top of River Bank:	782.2m (445cms)
Design Flood:	785.08m	Zero Staff Gage:	777.0m
	September 1978 (2,020cms)	Bottom of Low Flow Channel:	777.0m

Alamito Creek Near Presidio, Texas



Alamito Creek Gaging Station
Station Number 08-3740.00

Alamito Creek Near Presidio, Texas

Description:
Gravity well and graphical water-stage recorder with the DCP with GOES high data rate telemetry located about 400 meters upstream from its confluence with the Rio Grande, and about 9.7 kilometers southeast of Presidio, Presidio County, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river kilometer 1,529, 13.8 river kilometers downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. Measurements of high flows are made from the highway bridge. The zero of the gage is 771.785 meters above mean sea level U.S.C.&G.S. datum.

Location:
On left bank 91.4meters upstream from the highway bridge on Farm-to-Market road 170 and 610meters upstream from the confluence with the Rio Grande and 9.7kilometers southeast of Presidio, Texas. The mouth of Alamito Creek is 1,529 river kilometers upstream from the Gulf of Mexico.

GPS Coordinates:
Latitude N29° 31'18"
Longitude W104° 17'19"

Driving Direction:

- Turn Right on O'Reilly Street until it turns to FM 170 east
- Drive on FM 170 east for 5.9 miles
- After crossing Alamito Creek Bridge turn left.

Records:
Records based on 23 current-meter measurements during the year at low and medium flows, a high flow rating curve determined by slope-area calculations, a continuous record of gage heights, and computations by shifting control methods.
Records available: 1932 through 2003.

Remarks:
A small irrigation reservoir (San Esteban) 16.9 kilometers south of Marfa, Presidio County, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Back water from the Rio Grande begins to affect the station record when the flow at the station on the Rio Grande below Rio Conchos reaches about 991 CMS.

Extreme Flows from Records:
Maximum flows were of 1,600 CMS, determined by slope-area calculations, on September 2,1962, with a gage height of 4.13 meters and minimum no flow occasionally.

Datum: 771.785m Above MSL U.S.C. & G.S.
Design Flood: 99.12cms
Type Station: Water Accounting
Equipment: Gravity well and water-stage recorder (graphical and digital), and DCP with GOES high data rate telemetry

			Elevation
Design Flood:	776.3m	Zero Staff Gage:	771.785m Above MSL
Top of River Bank:	N/A	Bottom of Low Flow Channel:	772.00m

Rio Grande Below Rio Conchos Near Presidio, Texas

Below Gaging Station
Station Number 08-3742.00

Rio Grande Below Rio Conchos Near Presidio, Texas

Description:
Cableway, bubbler gage, water-stage recorders (graphic and digital), DCP with GOES high data rate telemetry, and data collection platform located on the left bank, and river kilometer 1,529; 0.6 river kilometer downstream from Alamito Creek and 14.4 river kilometers downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. The zero of the gage is 771.75 meters above mean sea level, U. S. C. & G. S. datum.
Location:
The instrument shelter is located on the left bank of the Rio Grande 0.4miles below Alamito Creek confluence, 10.1miles downstream from Presidio, Texas; 307.3 river miles down stream from American Dam at El Paso, Texas and 940.0miles above the Gulf of Mexico.
GPS Coordinates:
Latitude N 29° 31'13" Longitude W104° 17'11"
Driving Direction:

- Turn Right on O'Reilly Street until it turn into FM 170 east and drive on FM 170 east for 6.1 miles
- After crossing Alamito Creek Bridge gaging station is on the Right hand side.

Records:
Records based on 25 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1955 through 2003. Records are also available from 1896 through June 13,1932 for a station located about 19.5 river kilometers downstream from the Rio Conchos and 2.1 kilometers upstream from Alamito Creek; and from June 14,1932 through 1954 for a station about 3.2 river kilometers downstream from the Rio Conchos and 18.3 river kilometers upstream from Alamito Creek.
Remarks:
Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection plat-form, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits. Prior to December 1, 1979 the zero of the gage was 772.97 meters above mean sea level, U. S. C. & G. S. datum. A concrete control weir at this station was partially removed in December 1991.
EXTREME FLOWS FROM RECORDS:
Momentary: Max. 1,730 CMS on September 30,1978, with a gage height of 4.70 meters. The greatest recorded flow occurred September 11,1904, with a peak flow estimated at 4,590 CMS at a station 19.0 kilometers upstream. Min. 0.01 CMS several days in July 1955 and June 30, 1958.
Datum: 771.75 Above MSL U.S.C. & G.S.
Design Flood: 1,190cms
Type Station: Flood Warning & Treaty Water Accounting
Equipment: Cableway, bubbler gage, water-stage recorders (graphic and digital), DCP with GOES high data rate telemetry

Elevation

Top of Hwy TX DOT 170:	780.30m	Top of River Bank:	774.49m (445cms)
Design Flood:	776.35m	Zero Staff Gage:	771.75m
	777.06m October 1, 1978 (1,510cms)	Bottom of Low Flow Channel:	771.00m

Cableway

Length:	892 ft	Cable Diameter:	1 3/16 in

Rio Grande Below Mulato Dam

Mulato Gaging Station
Station Number 08-3743.00

Rio Grande Below Mulato Dam

Description:
During the 2008 flood the Mulato gaging station was washed out and is currently in the process of been replaced.

Location:
The shelter is located on the left bank of the Rio Grande below Mulato Dam. The orifice line located at latitude 29° 12’ 5.4” and longitude 104° 12’ 56.5”

GPS Coordinates:
Latitude 29° 29’8”
Longitude 104° 12’57. 9”

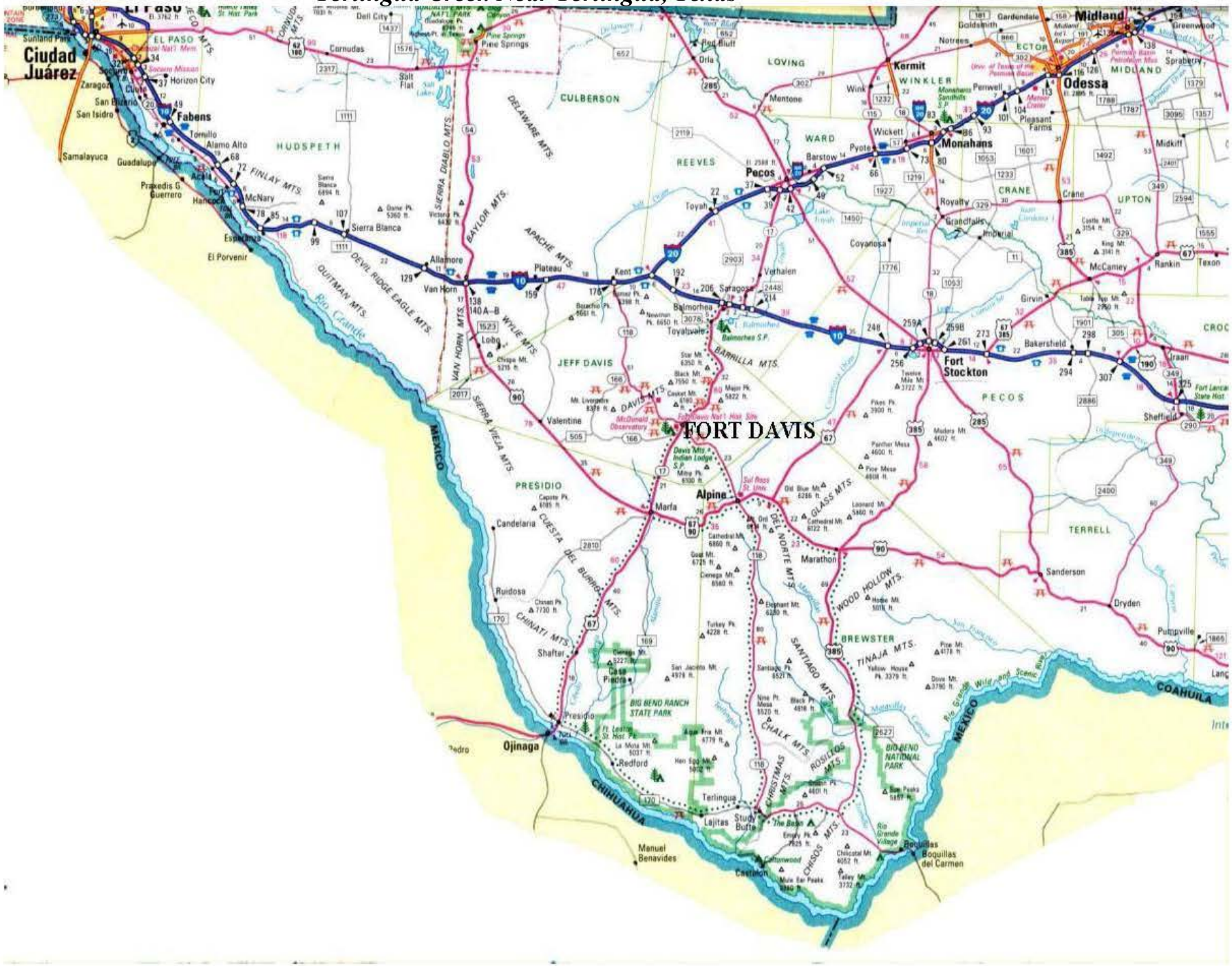
Driving Direction:

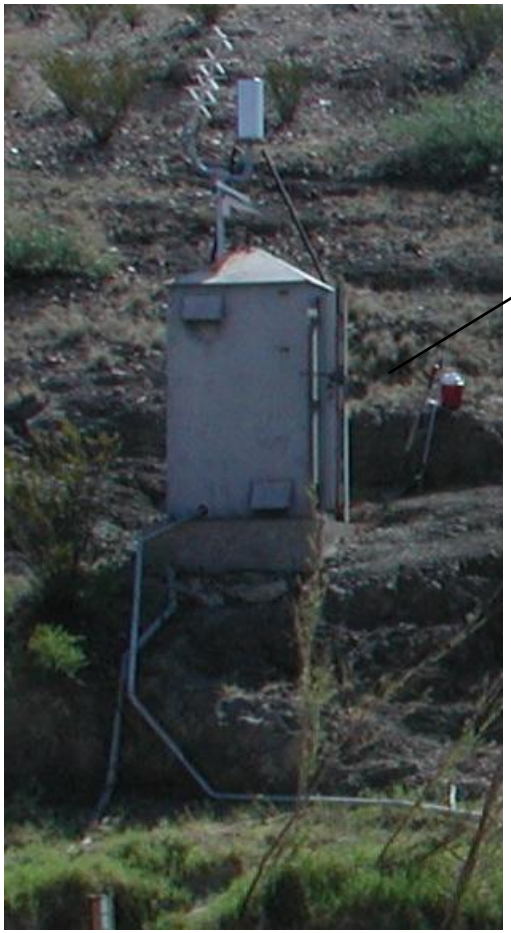
- Turn Right on O’Reilly Street
- Drive on FM 170 for 10.7 miles
- Turn right to Palo Amarillo Gate lock # 2640 follow dirt road 3 tenths of a mile
- Turn left and continue 3 tenths of a mile
- Turn left and continue 1 tenths of a mile and station located on the right, shelter lock # 2640

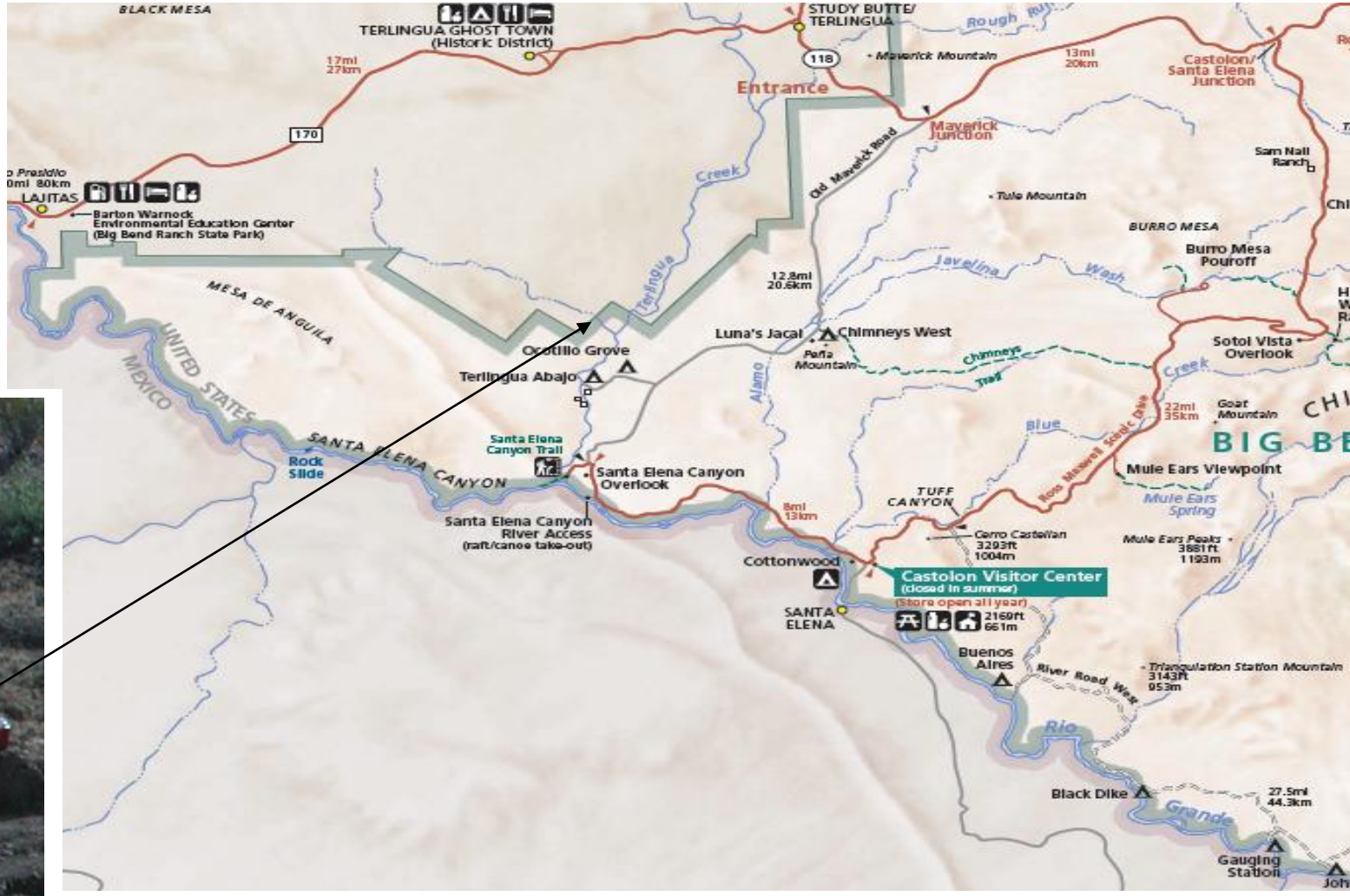
Records:
Records available: December 18. 2002 to September 04, 2008

Datum:	m U.S.C. & G.S.
Equipment:	bubbler gage, DCP with GOES high data rate telemetry, water-stage recorder (graphical and digital)
The zero of the gage:	m

Terlingua Creek Near Terlingua, Texas







Terlingua Gaging Station
Station Number 08-3745.00

Terlingua Creek Near Terlingua, Texas

Description:
Cableway, bubbler gage, DCP with GOES high data rate telemetry, graphical water-stage recorder located on the left bank at latitude 29`12'10", longitude 103`37'10", 4.3 creek kilometers upstream from its confluence with the Rio Grande, and about 13.6 kilometers south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river kilometer 1,425, the lower end of Santa Helena Canyon. The zero of the gage is 670.83 meters above mean sea level, U. S. C. & G. S. datum.

Location:
Latitude 29° 12'10", Longitude 103° 37'10", (determined from C.E. Map, Terlingua Abaja Quadrangle, 1:62,500), on left bank of the creek 4.3kilometers upstream from the confluence of Terlingua Creek with the Rio Grande and 13.6kilometers south of Terlingua, Texas. This creek enters the Rio Grande at river kilometer 1,425, the lower end of Santa Elena Canyon.

GPS Coordinates:
Latitude N 29° 12' 04" Longitude W 103° 36' 19"

Driving Direction:

- Turn Right on O'Reilly Street and drive on FM 170 for 63 miles to Terlingua the turn right at intersection to highway 118 South and
- Pass Big Bend National Park entrance on Old Maverick road junction turn right and drive 11 miles
- Turn Left on intersection to Terlingua Abajo and follow dirt road to gate, lock 2640 and follow service road, Terlingua gaging station on right and Station 137 meters upstream of the cableway
- From Terlingua gaging station you can reach Johnson gaging station by turning right on Old Maverick road. Follow Old Maverick road to Ross Maxwell Scenic Drive that is a paved road. From Ross Maxwell Scenic Drive turn right on River Road West. From River Road turn on Gauging Station sign.

Records:
Record is based on 23 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods.
Records available: 1932 through present

Remarks: Irrigation diversions upstream of the station modify the flow of this spring-fed creek.

Extreme Flows From Records:
Maximum flows were of 988cms on May 24, 1935 with a gage height of 5.36 meters on a gage 0.5 kilometer downstream and with a minimum no low on several occasions in 1986.

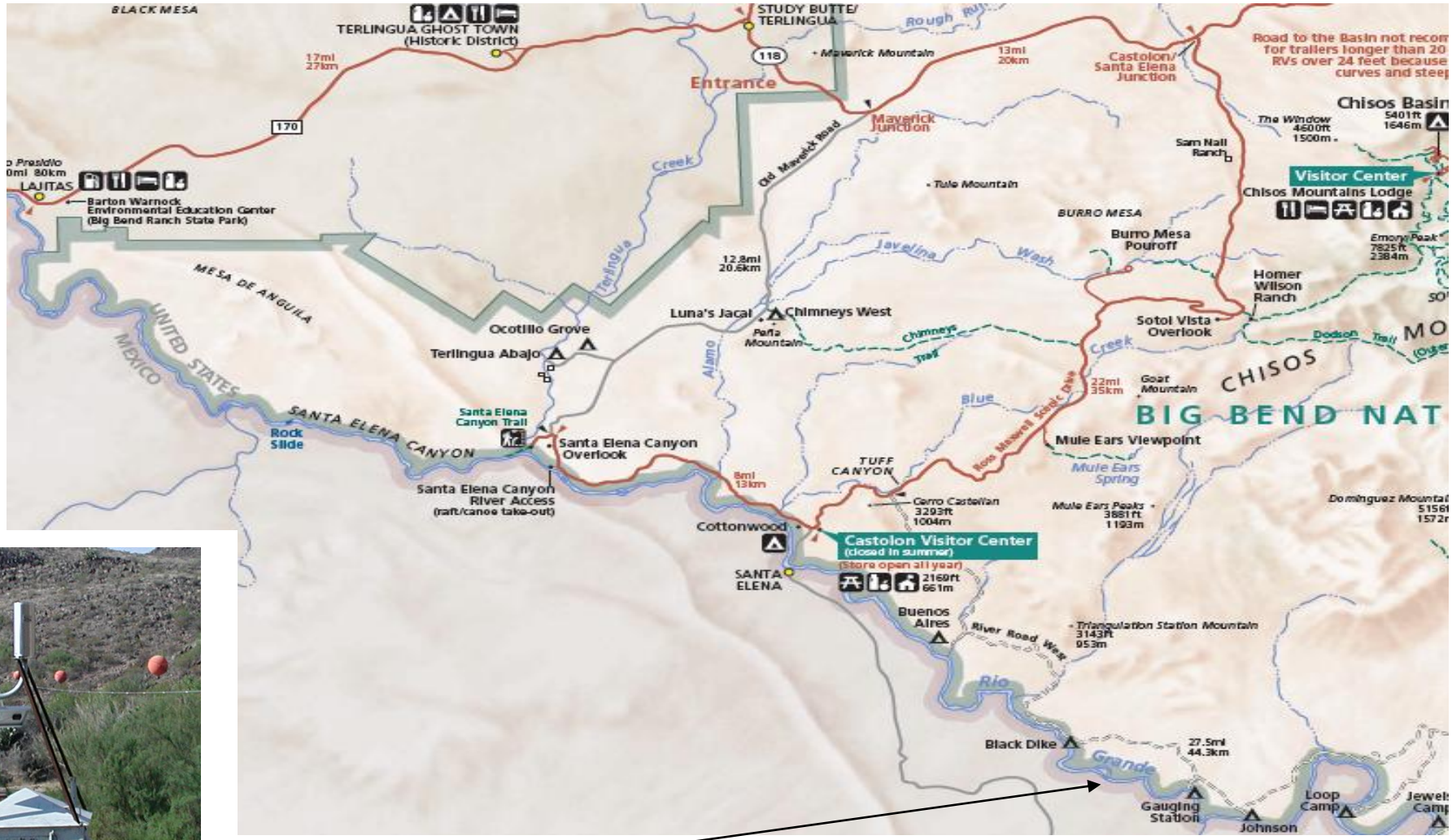
Datum: 670.83m Above MSL U.S.C. & G.S.
Type Station: Water Accounting
Equipment: Cableway, bubbler gage, DCP with GOES high data rate telemetry, water-stage recorder (graphical and digital)

			Elevation
Top of Bank:	675.92m	Zero Staff Gage:	670.83m
Design Flood:	673.00m May 1935 (988cms)	Bottom of Low Flow Channel:	670.2m

CABLEWAY

Length:	415 ft	Cable Diameter:	1 3/16 in


El Paso
Ciudad Juárez
Sunland Park
Horizon City
Fabens
Tornillo
Alamo Alto
Samalayuca
Guadalupe
Praxedis G. Guerrero
McNary
Sierra Blanca
El Porvenir
Allamore
Van Horn
Plateau
Kent
Balmorhea
Toyahvale
Lobo
Valentine
FORT DAVIS
Alpine
Marfa
Candelaria
Ruidosa
Shafter
Presidio
Ojinaga
Redford
Terlingua
Lajitas
Study Butte
Manuel Benavides
Castolon
Boquillas del Carmen
Big Bend Ranch State Park
Big Bend National Park
Dell City
Pine Springs
Salt Flat
Cornudas
Orla
Red Bluff
Mentone
Kermit
Wink
Wickett
Pyote
Barstow
Pecos
Toyah
Coyanosa
Verhalen
Saragosa
Royalty
Grandfalls
Imperial
Monahans
Odessa
Midland
Pleasant Farms
Notrees
Goldsmith
Gardendale
Greenwood
Sprabery
Midkiff
Crane
McCamey
Rankin
Texon
Girvin
Iraan
Sheffield
Fort Stockton
Bakersfield
Marathon
Sanderson
Dryden
Pumpville
Langtry
Del Rio
Coahuila
Mexico
Chihuahua
Culberson
Loving
Winkler
Ward
Reeves
Jeff Davis
Presidio
Brewster
Pecos
Crane
Upton
Terrell
Crockett
Hudspeth
Delaware Mts.
Sierra Diablo Mts.
Baylor Mts.
Apache Mts.
Finlay Mts.
Devil Ridge Eagle Mts.
Quitman Mts.
Van Horn Mts.
Wylie Mts.
Barrilla Mts.
Davis Mts.
Sierra Vieja Mts.
Glass Mts.
Del Norte Mts.
Wood Hollow Mts.
Tinaja Mts.
Santiago Mts.
Chalk Mts.
Rosillos Mts.
Christmas Mts.
Chisos Mts.
Cuesta del Burro Mts.
Chinati Mts.
Río Grande
Río Conchos
Pecos River



Johnson Gaging Station
Station Number 08-3750.00

Grande at Johnson Ranch Near Castolon

Description:
Cableway, gravity well, DCP with GOES high data rate telemetry, graphical water-stage recorder, and G.O.E.S. Data Collection Platform, and river kilometer 1,388; 2.2 river kilometers upstream from the old Johnson Ranch headquarters, 9.7 river kilometers downstream from Smoky Creek, and 14.8 river kilometers up-stream from Chizos Crossing and the Chihuahua-Coahuila state line. The zero of the gage is 623.41 meters above mean sea level, U. S. C. & G. S. datum.

Location:
On left bank of the Rio Grande, two miles west-northwest of old Johnson Ranch Headquarters, 5.5 river miles downstream from Smoky Creek, U.S. tributary, 10miles southeast of Castolon, Brewster County, Texas, 392.9 river miles downstream from the American Dam at El Paso, Texas, and 862.4 river miles upstream from the Gulf of Mexico.
To reach this station from Castolon, Texas take the paved road, 2.2miles toward Tuff Canyon Overlook, then turn off down river on dirt road; take right fork through small arroyo for .6miles to the top of a volcanic black rock hill overlooking the gage wall and cable.

GPS Coordinates:
Latitude N29° 02'06"
Longitude W103° 23'26"

Driving Direction:

- Turn Right on O'Reilly Street
- Drive on FM 170 for 63 miles to Terlingua
- Turn right on intersection on 118 South
- Enter BBNP
- On Castolon's intersection turn right
- Turn left on River Road west entrance
- At Rio Grande intersection turn left
- Turn right on gaging station sign
- Turn right on service road to Johnson Ranch station

- From Johnson gaging station you can reach Terlingua gaging station by driving back on River Road West
- Then turn left on Ross Maxwell Scenic Drive toward Castolon
- Continue to intersection of Santa Elena Canyon and Old Maverick Road turn right
- Continue to Terlingua Abajo Junction turn left to reach Terlingua gaging station.

- From Terlingua Abajo turn left on Old Maverick Road drive 11 miles to park entrance
- Turn left to highway 118

Records:
Records based on 21 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods.

Records available: April 1936 through 2003.

Remarks:
Reservoirs, diversions, and drainage returns modify the river flow at this station. The Data Collection Platform transmits gage heights by radio via NWS G.O.E.S. satellite to NWS computer bank.

Extreme Flows From Records:
Maximum 2,040cms, on September 30, 1978 with a gage height of 8.66 meters a flow estimated at 2,750cms with a stage of 7.50 meters occurred at this station site on October 3, 1932 and minimum of no flow several days in 1953, 1955, 1957, and 1958.

Datum:	623.41m Above MSL U.S.G. &G.S.
Type Station:	100 year flood
Equipment:	Cableway, gravity well, DCP with GOES high data rate telemetry, water-stage recorder (graphical and digital)

		Elevation	
Bottom of Gage:	632.41m	Zero Staff Gage:	623.41m
Design Flood:	630.0m	Bottom of Low Flow Channel:	623.00m
	632.1m September 30, 1978 (2,040cms)		
Top of River Bank:	632.41m		

CABLEWAY

Length:	325 ft	Cable Diameter:	13/16 in

EXHIBIT 4
FLOOD PATROL SECTORS

General Instructions for Patrolpersons
Flood Patrol and Flood Fighting

1. Each person involved must realize and know the extreme importance and responsibility of his part and position in the flood fighting organization.
2. Each person on patrol as well as others should be alerted and instructed to observe, record, and report.
    a. Progressive flood stages
    b. Boils and seeps on the landside of levees and dikes
    c. Slope and crown erosion from waves and currents
    d. Structures' condition and proper operation of same
    e. Pumping across levee into floodway – watch for levee erosion and pipes should be covered to permit traffic over them.
    f. Watch levee freeboard – report any condition that is less than 4' measured vertically.
3. Observe at all times the safety rules and safety program.
4. Assure that equipment is at all times serviced, fueled and ready to go at a moment's notice. It will be Management's responsibility to see that equipment is strategically placed.
5. Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sightings or condition, however seemingly unimportant.
6. Each patrolperson shall not leave his post or assigned patrol sector until relieved or unless instructed otherwise.
    a. Each patrol unit will be furnished a log book. All gage readings, problems, emergency situations, etc., should be recorded, together with time and date. Each patrolperson should sign the log book at the end of his shift.
    b. Upon being relieved, he will pass on to his relief the log book, the present situation prevailing in his particular sector, any particular work or instructions that are to be carried out during the shift just passed.
    c. Each patrolperson shall be expected and prepared to "double shift" if an emergency should require same.
7. Patrol areas and special instructions regarding Patrol Sectors are listed below.

<u>Patrol Sectors</u>

1. MM0 to MM5.0
2. MM5.0 to MM10.5
3. MM10.5 to 15.2

EXHIBIT 5
RIVER MILEAGES

Location	River Miles	Miles from the Presidio Project Office
Tri-County	1093.33	135.6
Candelaria Gaging Station	1038.81	81.08
Capote Creek	1038.35	80.62
Candelaria, Texas	1035.53	77.80
Ruidosa, Texas	1016.28	58.50
Above Gaging Station	963.73	6
Rio Conchos Confluence	961.36	3.63
Cibolo Creek	959.60	2.87
Vehicle Bridge Gaging Station	958.73	1
Railroad Bridge	957.26	2.47
Alamito Creek Gaging Station	950.14	9.59
Below Gaging Station	949.76	9.97
Mulato Gaging Station	944.42	15.31
Redford, Texas	938.76	20.97
Lajitas, Texas	903.68	56.05
Terlingua Creek Gaging Station	885.23	74.5
Castolon, Texas	877.87	81.86
Johnson Ranch Gaging Station	862.44	97.29
Big Bend National Park		99.0
La Linda Bridge	776.79	182.94

EXHIBIT 6
TELEPHONE LISTINGS

5 U.S.C. 552(B)(7)(E) AND (F)

SECTION B

...

Cell Phones

SECTION C
TELEPHONE LISTING OF THE IBWC MEXICAN SECTION

5 U.S.C. 552(B)(7)(E) AND (F)

SECTION D
TELEPHONE LISTING OF C.N.A

SECTION E
TELEPHONE LISTING OF FEDERAL, STATE, AND LOCAL AUTHORITIES

Office	Telephone Number

5 U.S.C. 552(B)(7)(E) AND (F)

SECTION F
SOURCES OF ASSISTANCE

EXHIBIT 7
GENERAL INSTRUCTIONS FOR PATROL PERSONNEL

1. Each person involved must realize and know the extreme importance and responsibility of his part and position in the flood fighting organization.

2. Patrol persons should be familiar with their assigned patrol sector and check for necessary supplies before leaving on patrol.

3. Each person on patrol as well as others should be alerted and instructed to observe, record, and report:

    a. Progressive flood stages
    b. Boils and seeps on the land side of levees and dikes
    c. Slope and crown erosion from waves and currents
    d. Structures condition and proper operation of same
    e. Pumping across levee into floodway – watch for levee erosion and pipes that should be covered to permit traffic over them
    f. Watch levee freeboard – report any condition that is less than four (4) feet measured vertically

4. Observe at all times the safety rules and safety program.

5. Assure that equipment is at all times serviced, fueled and ready to go at a moment's notice. It will be the responsibility of management to see that equipment is strategically placed.

6. Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sightings or condition however seemingly unimportant.

7. Each patrolperson shall not leave his post or assigned patrol sector until relieved or unless instructed.

    a. Each patrol until will be furnished a log book. All gage reading, problems, emergency situations, etc. should be recorded, together with time and date. Each patrolperson should sign the log book at the end of his shift.
    b. Upon being relieved, he will pass on to his relief the log book, the present situation prevailing in his particular sector, any particular work or instructions that are to be carried out during the succeeding shift as well as information of happenings and the prevailing conditions during the past shift.
    c. Each patrolperson shall be expected and prepared to "double shift" if the emergency should require same.

8. Patrol areas and special instructions regarding Patrol Sectors are found in **Exhibit 9, "Flood Patrol Sectors."**

EXHIBIT 8
SECTION A
RECOMMENDED FLOOD FIGHT TRAINING

All Projects as applicable should give proper training on the following subject:

1. Gage reading

2. Structure Operation

3. Danger signs

4. Operation of Radios and Other Communication Systems

5. 24-Hour Military Time System

6. General Instructions for Flood Patrols:
   a. Patrol Sectors
   b. Times of Shifts
   c. Location and Number of Gages to be Read

7. Safety Equipment and Procedures

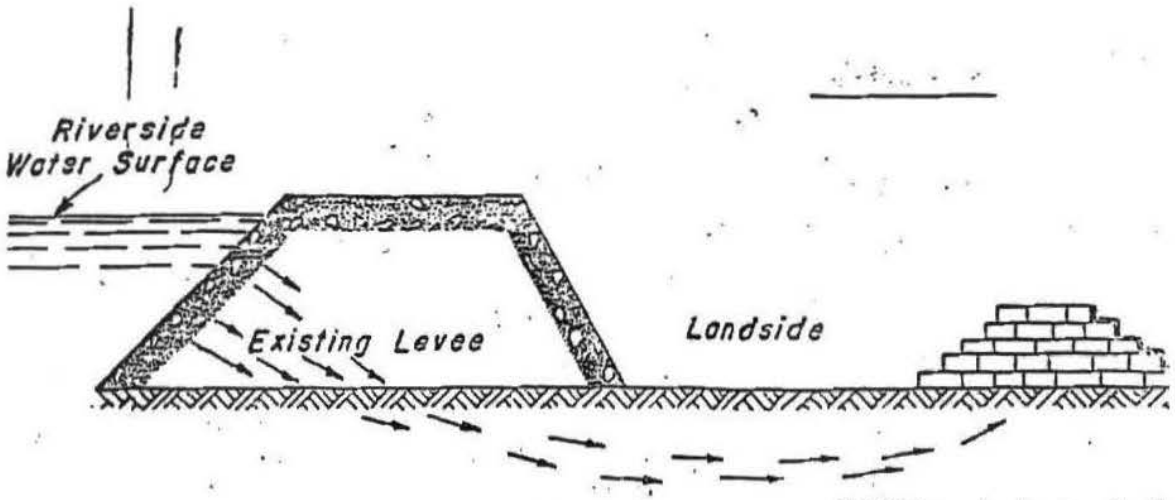
8. Flood Alert Exercises

9. Flood Fight Procedures
   a. Control Sand Boils
   b. Wave Wash and Current Erosion
   c. Overtopping of Levees

SECTION B
FLOOD FIGHT METHODS

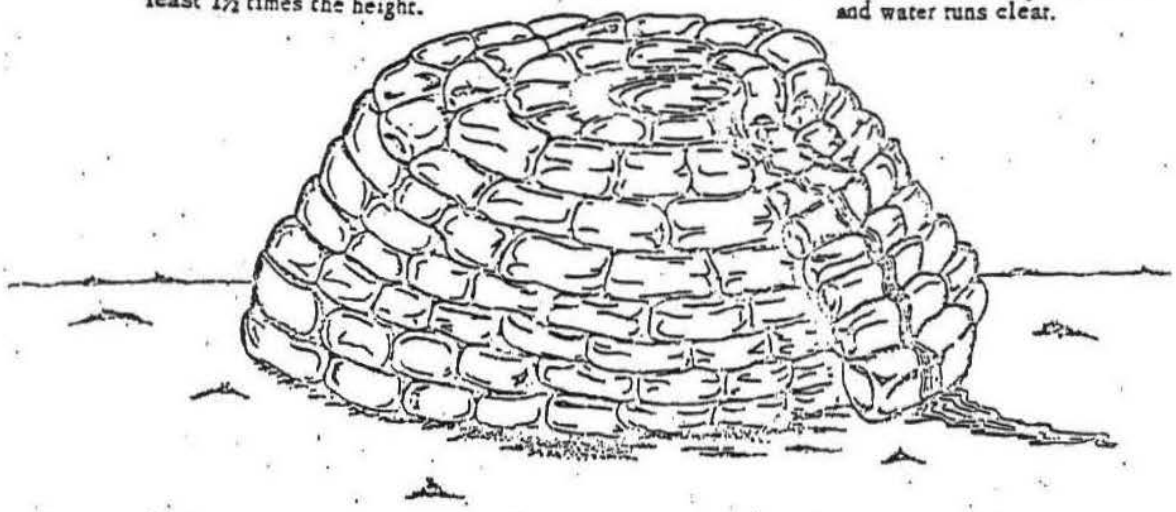
Methods

1. Control of Sand Boils (Away from Levee)
2. Control Sand Boil (Near Levee)
3. Wave Wash Protection
4. Control of Current Scouring
5. Current Deflector and Velocity Retard for Prevention of Slope Erosion
6. Additional use of Sandbags
7. Control of Levee overtopping



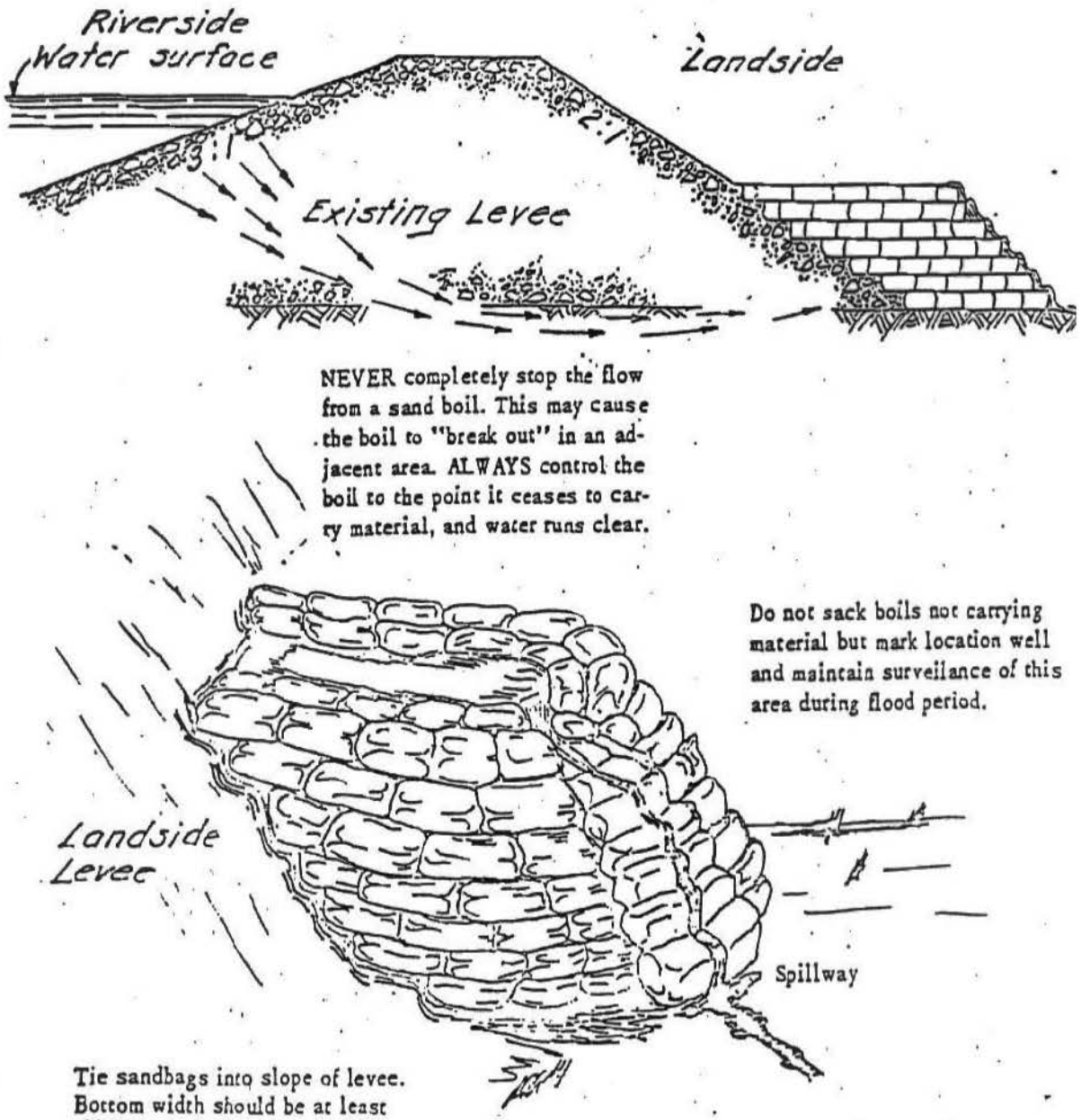
NEVER completely stop the flo
from a sand boil. This may cau
the boil to "break out" in an a
jacent area.
ALWAYS control the boil to the
point it ceases to carry materia
and water runs clear.

Bottom width should be at
least 1½ times the height.



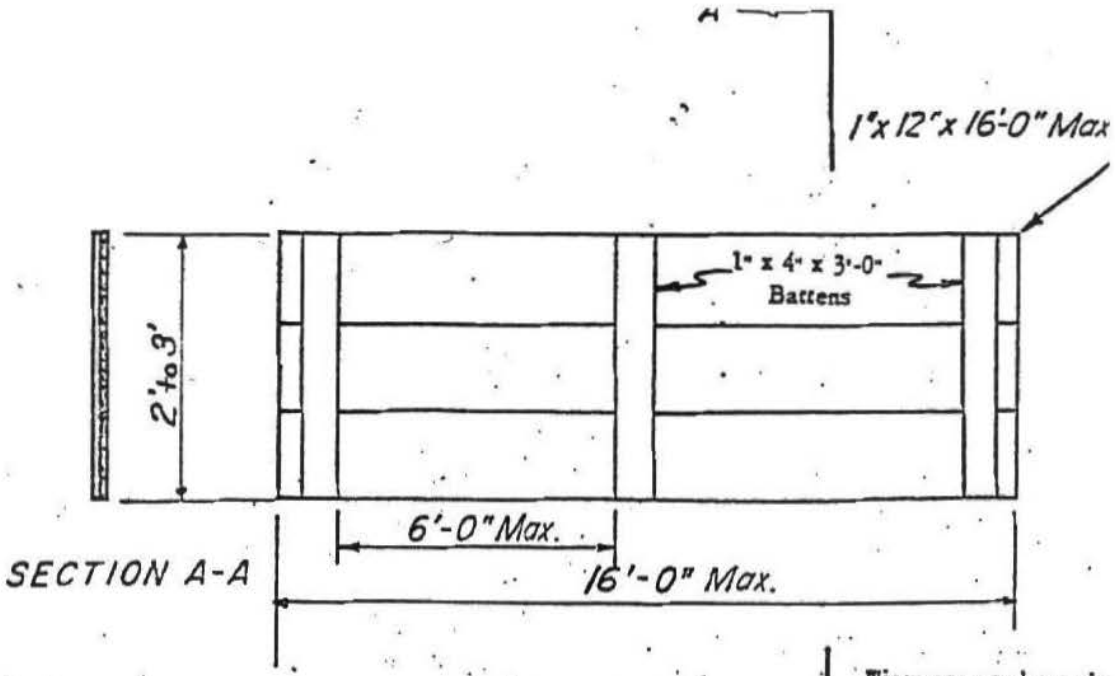
Do not sack boils not carrying
material but maintain surveilance
during flood periods.

INTERNATIONAL BOUNDARY & WATER COMMISSI
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING
CONTROL OF SAND BOILS
(Away from levee)



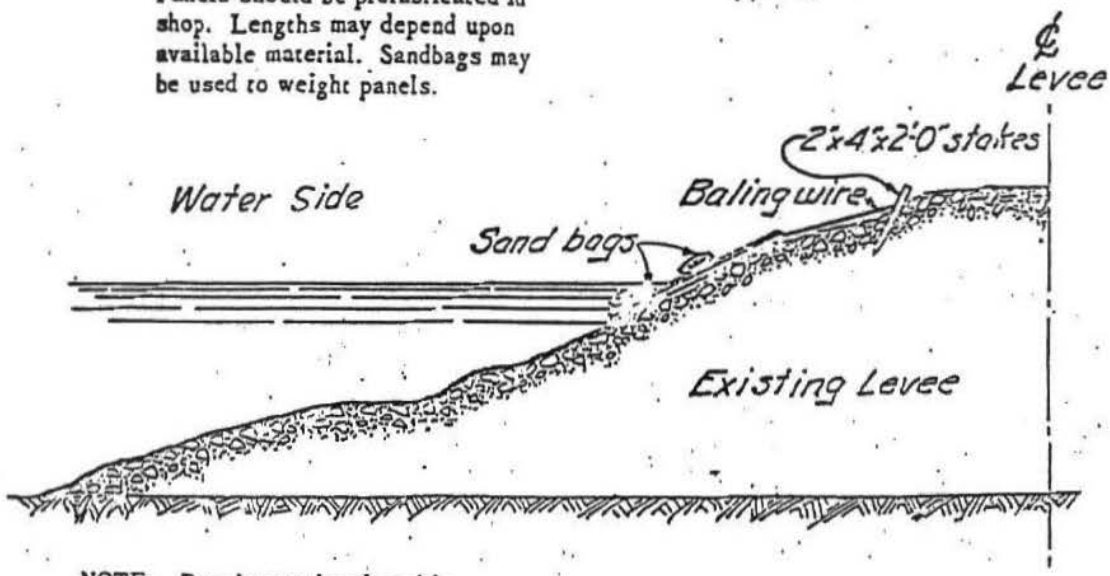
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

CONTROL OF SAND BOILS
(Near levee)



Wires are used to rais
lower panels with var
water elevation.

Panels should be prefabricated in shop. Lengths may depend upon available material. Sandbags may be used to weight panels.



NOTE: Panels may be placed in a vertical position depending upon existing conditions.

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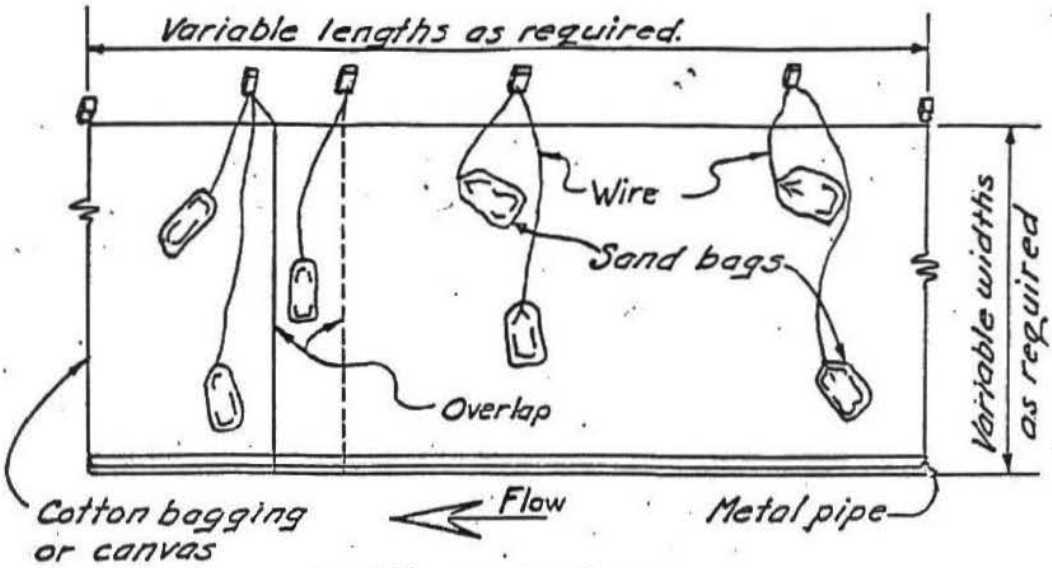
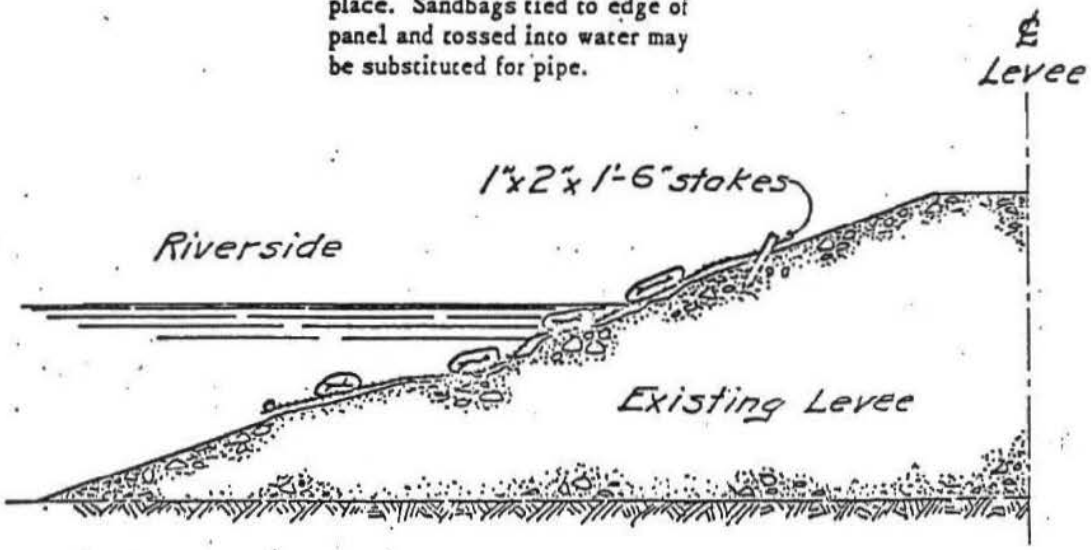
METHODS OF FLOOD FIGHTING

WAVE WASH PROTECTION



Material is wrapped on pipe and rolled into water. Bags placed at random keep cloth panels in place. Sandbags tied to edge of panel and tossed into water may be substituted for pipe.



Always lay cloth panels in an upstream direction. Tie all bags to levee with wire and stakes.

INTERNATIONAL BOUNDARY & WATER COMMISSI
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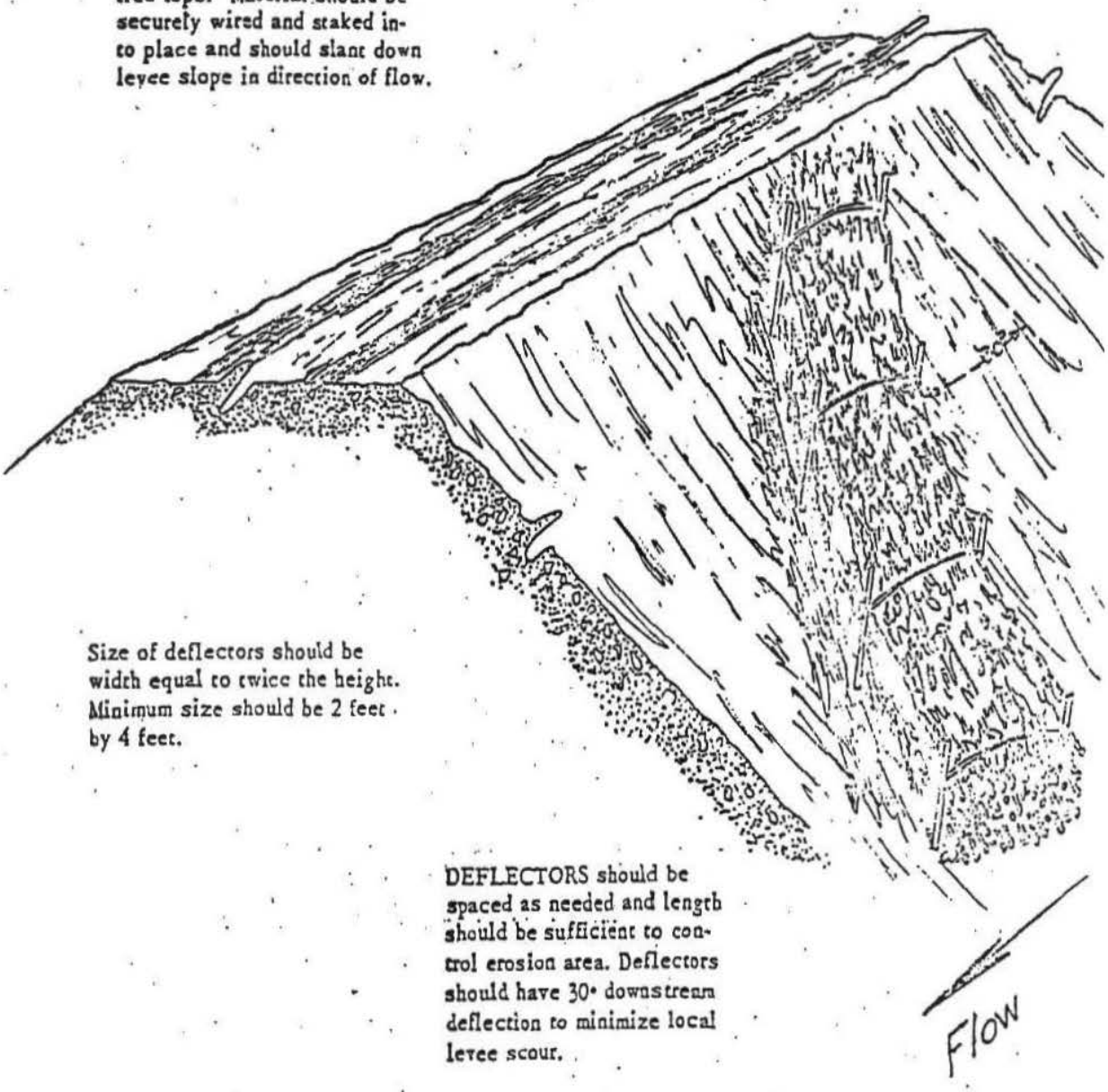
METHODS OF FLOOD FIGHTING
WAVE WASH PROTECTION

DEFLECTORS may consist of brush, stone-filled bags or tree tops. Material should be securely wired and staked into place and should slant down levee slope in direction of flow.



Size of deflectors should be width equal to twice the height. Minimum size should be 2 feet by 4 feet.

DEFLECTORS should be spaced as needed and length should be sufficient to control erosion area. Deflectors should have 30° downstream deflection to minimize local levee scour.

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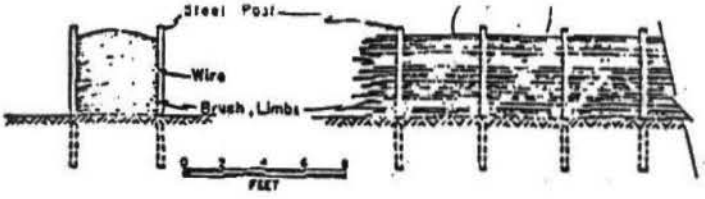
METHODS OF FLOOD FIGHTING

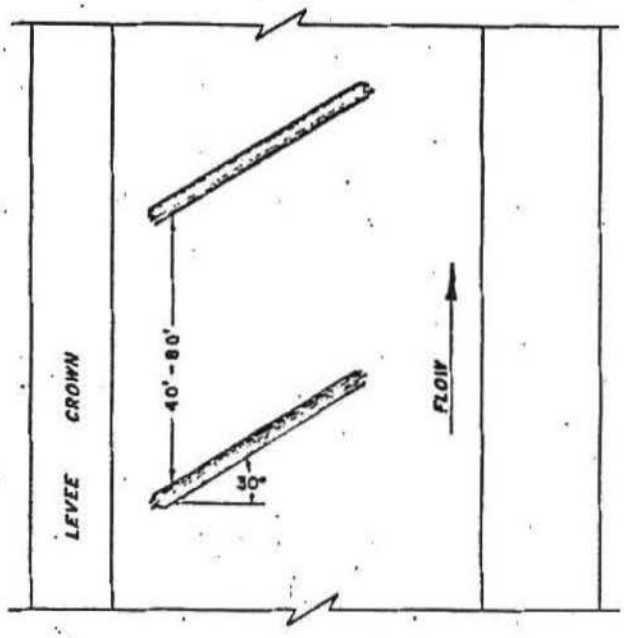
CONTROL OF CURRENT SCOURING

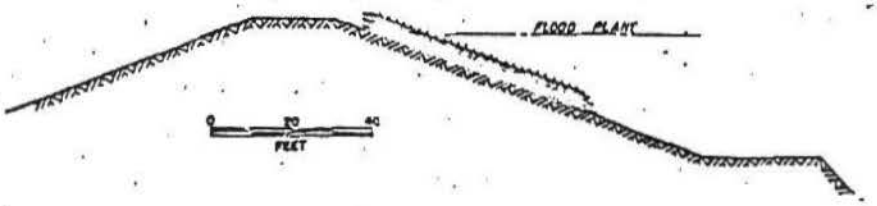


Bale brush for ease in handling
Sawbuck may be used as improvised bailing frame

Use wire for guying posts and tying down brush bales
Weight structure with rock, cobbles if available

Bankhead (upper end) must be securely anchored well above water line





INTERNATIONAL BOUNDARY & WATER COMMISSI
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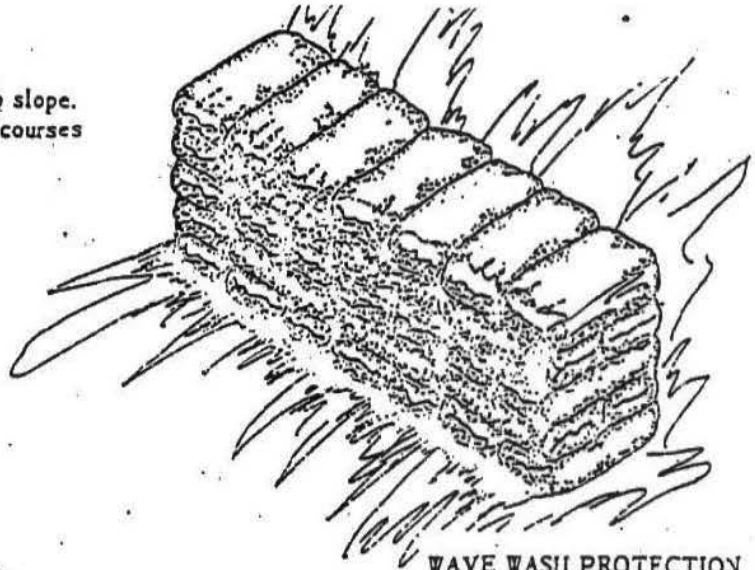
METHODS OF FLOOD FIGHTING

CURRENT DEFLECTOR AND VELOCI
RETARD FOR PREVENTION OF
SLOPE EROSION

REVETMENTS

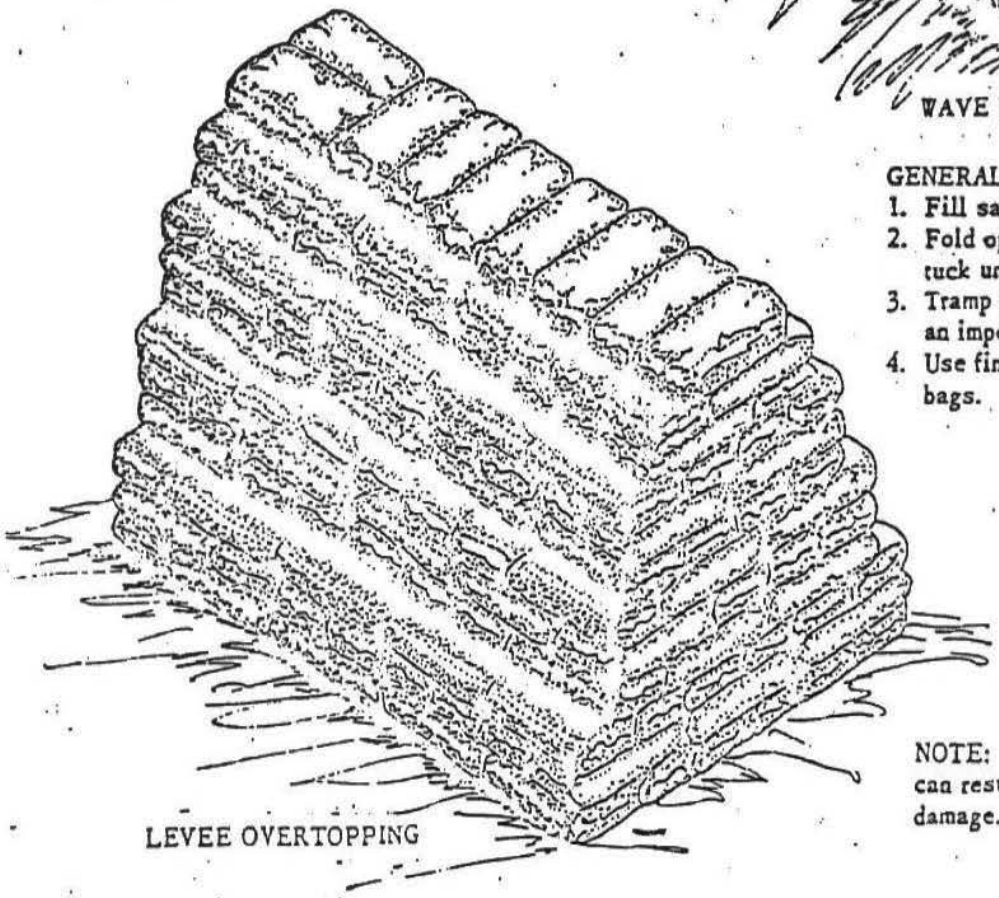
Place bags perpendicular to slope. Place header and stretcher courses as shown.



WAVE WASH PROTECTION

GENERAL:

1. Fill sandbags ½ to 2/3 full.
2. Fold open end of bag over & tuck underneath.
3. Tramp bags with feet to obta an impervious section.
4. Use fine sand or silt for fillir bags.



LEVEE OVERTOPPING

NOTE: Improperly placed ba can result in failure & serious damage.

LEVEE SECTION

For heights 1 foot or less lay 3 single staggered courses in a lengthwise direction. For heights in excess of 1 foot lay bags in manner shown above with height proportional to base.

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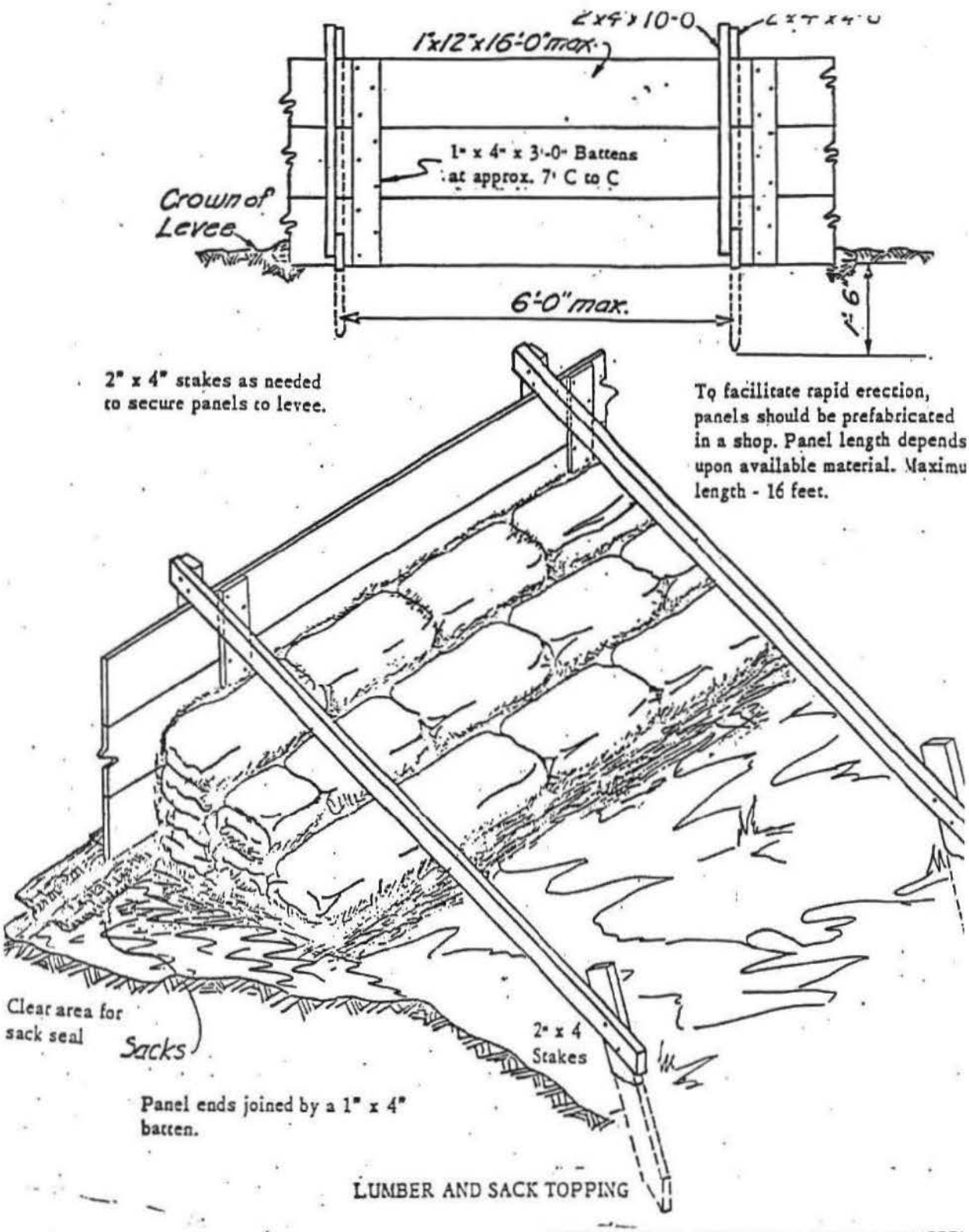
UNITED STATES SECTION

METHODS OF FLOOD FIGHTING

ADDITIONAL USES OF SANDBAGS



LUMBER AND SACK TOPPING

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UNITED STATES & MEXICO
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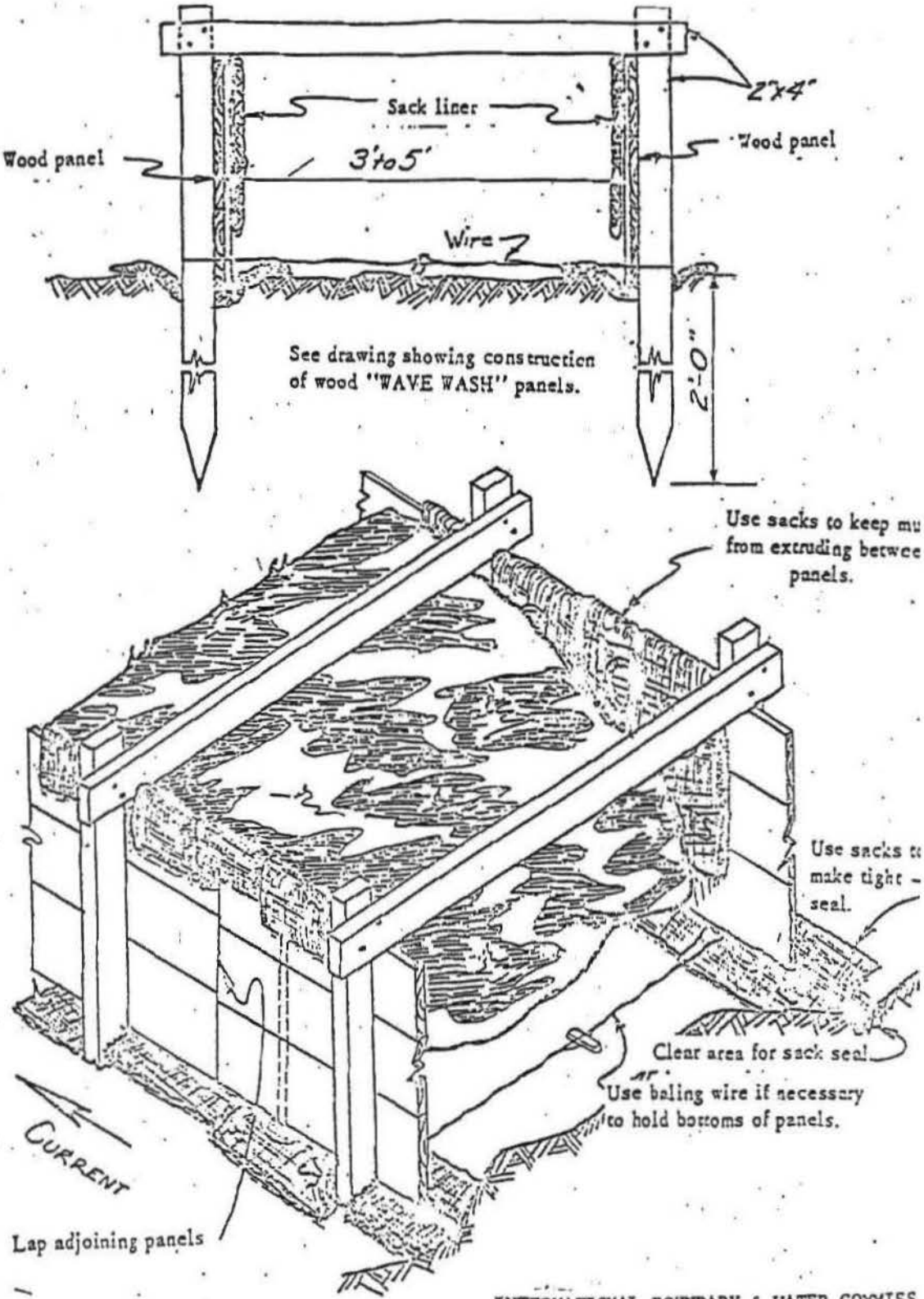
METHODS OF FLOOD FIGHTING

CONTROL OF LEVEE OVERTOPPING



MUD BOX

INTERNATIONAL BOUNDARY & WATER COMMISS
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

CONTROL OF LEVEE OVERTOPPING

EXHIBIT 9
MEMORANDUM OF UNDERERSTANDING
BETWEEN
NATIONAL WEATHER SERVICE AND THE IBWC

EXHIBIT 10
MEMORANDUM OF UNDERSTANDING
BETWEEN
U.S. ARMY CORPS OF ENGINEERS AND THE IBWC

DUPLICATE ORIGINAL

MEMORANDUM OF UNDERSTANDING
BETWEEN
SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS
AND
UNITED STATES SECTION, INTERNATIONAL BOUNDARY
AND WATER COMMISSION, UNITED STATES AND MEXICO

This Memorandum of Understanding entered into this 27th day of November 1990, between the Southwestern Division, U. S. Army Corps of Engineers, hereinafter referred to as the "Corps", and the United States Section, International Boundary and Water Commission, United States and Mexico, hereinafter referred to as the "United States Section", WITNESSETH:

WHEREAS, the United States Section is authorized under 22 U.S.C.A. Sec. 277a, as amended, to construct, operate and maintain flood control works on the Rio Grande, and is authorized under 22 U.S.C.A. Sec. 277d-12, as amended, to expend from appropriations available to it such sums as may be necessary for prosecution of emergency flood fighting and rescue operations, repairs or restoration of any flood control works threatened or destroyed by floodwaters of the Rio Grande; and

WHEREAS, the Corps has authority under 33 U.S.C.A. Sec. 701n, as amended, to expend funds and engage in emergency flood fighting, rescue operations, and repairs or restoration of any flood control works threatened or destroyed by floods, including the strengthening, raising, extending, or other modifications thereof as may be necessary in the discretion of the Chief of Engineers for the adequate functioning of the work for flood control; and

WHEREAS, in order that all domestic obligations and functions prescribed by said laws and all international responsibilities of the United States Section may be coordinated and fulfilled in the manner contemplated, it is considered to be mutually desirable to define and set forth the specific jurisdiction and functions to be exercised by the United States Section and the Corps with respect to the Rio Grande and its tributaries in the States of New Mexico and Texas.

NOW, THEREFORE, the parties hereto agree as follows:

1. The United States Section shall be the responsible agency to prosecute emergency flood fighting and rescue

operations, repairs or restoration of any flood control works of the Rio Grande (and for coordination of such activities as may be necessary with authorities of the Mexican Section of the International Boundary and Water Commission), as follows:

(a) On the main stem of the Rio Grande from Caballo Dam to the beginning of the international boundary at El Paso, Texas; then downstream to the mouth of the Rio Grande at the Gulf of Mexico, including 96 miles of river levees of the Lower Rio Grande Flood Control Project from Penitas, Texas to a point 15 miles below Brownsville, Texas.

(b) Interior floodways of the Lower Rio Grande Flood Control Project, extending 137 miles in length.

2. The Corps shall have the responsibility for flood emergency preparation, flood fighting, rescue operations, and the repair and restoration of any flood control work threatened or destroyed by floodwaters on tributaries of the Rio Grande below Caballo Dam.

3. The flood fighting resources of the Corps and the United States Section shall be available to one another upon request for such assistance. For such purpose, it is agreed that the following principles and procedures will, to the extent practicable, govern cooperation between the parties hereto:

(a) During emergencies, close liaison will be maintained between Principal Engineer of the United States Section and the appropriate Corps District Commander, or his designated representative, for the exchange of all pertinent information and basic hydrologic data.

(b) If so requested by the United States Section, assistance of the Corps will be furnished, on a cost-reimbursable basis, by the Albuquerque Engineer District in the reach of the Rio Grande from Caballo Dam to the mouth of the Pecos River; by the Fort Worth Engineer District in the reach from the mouth of the Pecos River to Falcon Dam; and by the Galveston Engineer District from Falcon Dam to the Gulf of Mexico.

(c) If so requested by the Corps, assistance will be furnished, on a cost-reimbursable basis, by authority and approval of the El Paso Headquarters of the United States Section for tributaries along reaches of the Rio Grande below Caballo Dam in the United States under jurisdiction of the said Corps.

DUPLICATE ORIGINAL

(d) Each District Commander of the Corps will designate an assistant who will represent his District in all contacts with the United States Section. The Commissioner of the United States Section will designate his representatives for all contacts with the Engineer Districts of the Corps.

(e) Each party to this Understanding will endeavor to provide the closest association and maximum cooperation and participation possible under the laws, regulations, and responsibilities governing it.

(f) It is understood that available forces of the Corps will continue, as in the past, to perform rescue work when, through any circumstance, such forces are the only ones in proximity to a scene of immediate need on the Rio Grande and interior floodways of the Lower Rio Grande Flood Control Project under the jurisdiction of the United States Section.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the date first hereinabove stated.

UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, El Paso, Texas

By _____
Dr. Narendra N. Gunaji, Commissioner

SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS, Dallas, Texas

By _____
Stanley G. Genega
Brigadier General, U.S. Army
Commanding General

EXHIBIT 11
FLOOD WARNING NOTICE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

A notice to the general public, all owners, lessees, and users of lands along the Rio Grande, in the Presidio Valley, Presidio County, Texas

The general public, owners, lessees, and users of lands on the United States banks of the river in the Presidio Valley are hereby notified that lands along the banks of the Rio Grande between the levee and the channel, depending upon their elevation, are subject to periodic flooding from local tributary inflows and by releases from the Rio Conchos. This notice is given as a public service to advise and inform you that human life, property, livestock, and other activities, existing or proposed, may be subject to flood damage, and are maintained or undertaken at your own risk.

Please be advised that during flood events, flood releases from the Rio Conchos and/or localized heavy rainfall/runoff events, the Rio Grande will unavoidably overflow its river channel and may adversely impact interests along its banks. Please refer to your local National Weather Service office for flood information during these events.

In order to protect life and property and to avoid potential obstruction or deflection of flows within the Rio Grande floodplain, the general public, owners, lessees, and users of land along the Rio Grande are advised for their own safety and for security of their properties to contact your Presidio County Officials and the United States Section, International Boundary and Water Commission, 110 South Dod Avenue, P.O. Box 848, Presidio, TX 79845, telephone number, (432) 229–3751, before making any use of the lands or constructing improvements on the lands along the river.

Sincerely,

For:

Edward Drusina, P.E.
Commissioner

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902-1441
(915) 832-4100 • Fax: (915) 832-4190 • http://www.ibwc.gov

EXHIBIT 12
LETTER OF AGREEMENT BETWEEN UNITED STATES OF AMERICA AND MEXICO OF DAM OPERATIONS

INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION

MERCEDES FIELD OFFICE

FLOOD EMERGENCY OPERATIONS MANUAL

LOWER RIO GRANDE FLOOD CONTROL PROJECT

Ed Drusina
United States Commissioner

May 2012

TABLE OF CONTENTS

FOREWORD

A. Requirement and Reference

This Flood Emergency Operations Manual has been prepared to define the United States Section's roles and responsibilities in time of flood; to assure that all personnel of the United States Section know their individual duties and responsibilities; and to assure that flood-fighting activities of the United States Section are coordinated with the responsible officers of the Mexican Section, and of other Federal, State and local agencies in the United States.

B. Control

The issuing office for this manual is Operations Department, Operations and Maintenance Division, Mercedes Field Office. Contact is Division Engineer, Operations and Maintenance Division.

C. Supersession

This manual cancels and supersedes previous manual M719, Volume IV dated June 17, 2011. All copies of the previous manual should be disposed of immediately

D. Effective Date

This manual becomes effective on May 11, 2012.

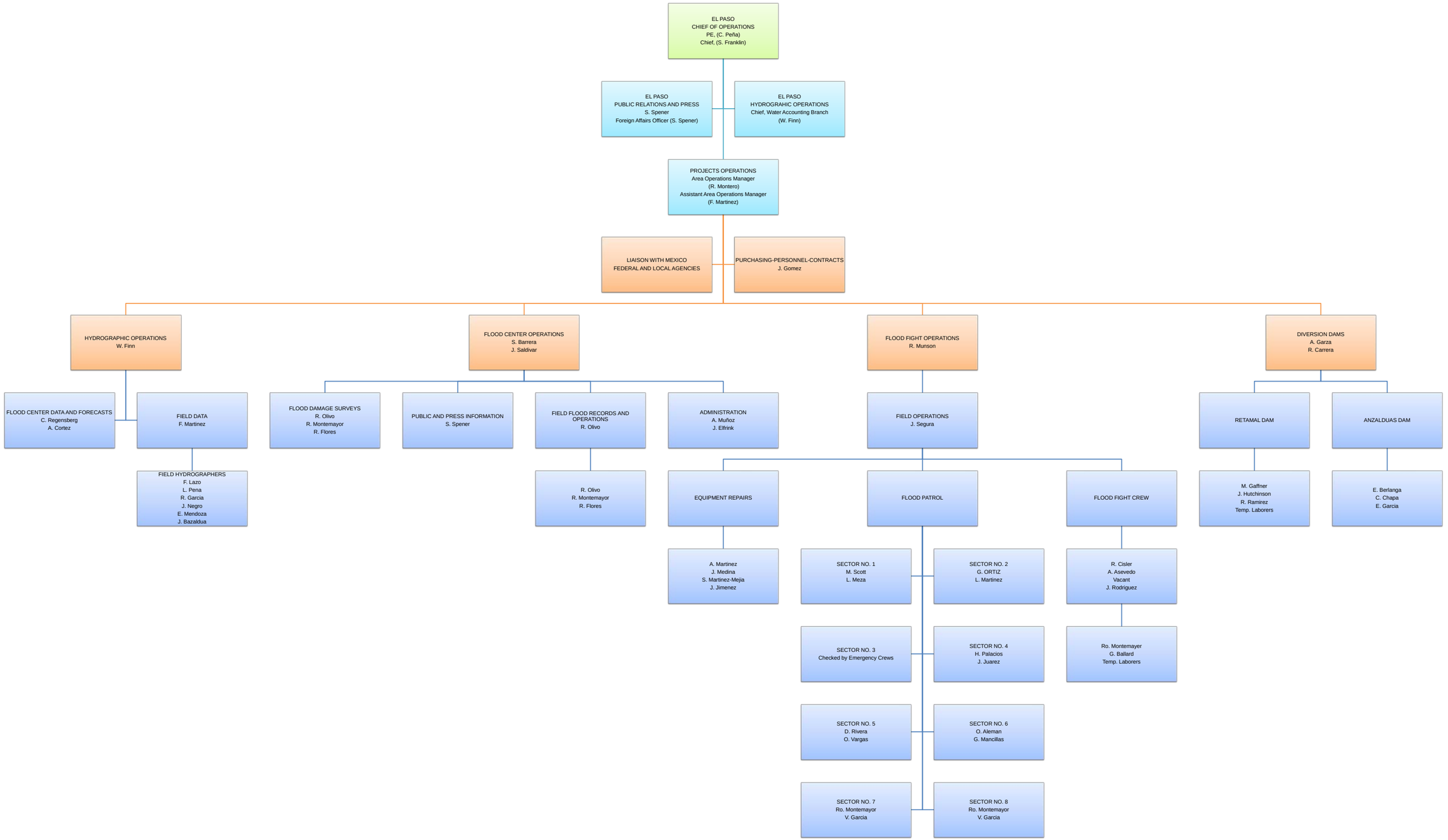

EL PASO
CHIEF OF OPERATIONS
PE, (C. Peña)
Chief, (S. Franklin)
EL PASO
PUBLIC RELATIONS AND PRESS
S. Spener
Foreign Affairs Officer (S. Spener)
EL PASO
HYDROGRAHIC OPERATIONS
Chief, Water Accounting Branch
(W. Finn)
PROJECTS OPERATIONS
Area Operations Manager
(R. Montero)
Assistant Area Operations Manager
(F. Martinez)
LIAISON WITH MEXICO
FEDERAL AND LOCAL AGENCIES
PURCHASING-PERSONNEL-CONTRACTS
J. Gomez
HYDROGRAPHIC OPERATIONS
W. Finn
FLOOD CENTER OPERATIONS
S. Barrera
J. Saldivar
FLOOD FIGHT OPERATIONS
R. Munson
DIVERSION DAMS
A. Garza
R. Carrera
FLOOD CENTER DATA AND FORECASTS
C. Regensberg
A. Cortez
FIELD DATA
F. Martinez
FLOOD DAMAGE SURVEYS
R. Olivo
R. Montemayor
R. Flores
PUBLIC AND PRESS INFORMATION
S. Spener
FIELD FLOOD RECORDS AND OPERATIONS
R. Olivo
ADMINISTRATION
A. Muñoz
J. Elfrink
FIELD OPERATIONS
J. Segura
RETAMAL DAM
ANZALDUAS DAM
FIELD HYDROGRAPHERS
F. Lazo
L. Pena
R. Garcia
J. Negro
E. Mendoza
J. Bazaldua
R. Olivo
R. Montemayor
R. Flores
EQUIPMENT REPAIRS
FLOOD PATROL
FLOOD FIGHT CREW
M. Gaffner
J. Hutchinson
R. Ramirez
Temp. Laborers
E. Berlanga
C. Chapa
E. Garcia
A. Martinez
J. Medina
S. Martinez-Mejia
J. Jimenez
SECTOR NO. 1
M. Scott
L. Meza
SECTOR NO. 2
G. ORTIZ
L. Martinez
R. Cisler
A. Asevedo
Vacant
J. Rodriguez
SECTOR NO. 3
Checked by Emergency Crews
SECTOR NO. 4
H. Palacios
J. Juarez
Ro. Montemayer
G. Ballard
Temp. Laborers
SECTOR NO. 5
D. Rivera
O. Vargas
SECTOR NO. 6
O. Aleman
G. Mancillas
SECTOR NO. 7
Ro. Montemayor
V. Garcia
SECTOR NO. 8
Ro. Montemayor
V. Garcia

Figure 1

INTRODUCTION

The Rio Grande from El Paso to the Gulf of Mexico is an international river; therefore, the control of its floods is an international undertaking of the governments of the United States and Mexico through the International Boundary and Water Commission.

The Lower Rio Grande Flood Control Project (Project) is located in the extreme southern part of Texas and northern Tamaulipas, Mexico and extends from Penitas, Texas to the Gulf of Mexico: a distance of 301 river kilometers (187 miles). The Project's flood control levees and interior floodway system in each country are operated and maintained by each country under a coordinated international plan.

The United States Section of the International Boundary and Water Commission (United States Section) is responsible, by law, for the construction and operation of works authorized for the protection of life and property against floods from the Rio Grande in the Lower Rio Grande Valley of the United States. Also, the United States Section is responsible for coordinating with the Mexican Section the diversion of the floodwaters from the main channel of the Rio Grande to the interior floodways in the two countries as an essential part of the interested Federal Agencies and of State and local authorities in the United States and the Mexican Section of the International Boundary and Water Commission.

PURPOSE

This Flood Emergency Operations Manual has been prepared to define the Unite States Section's roles and responsibilities in time of flood; to assure that all personnel of the United States Section know their individual duties and responsibilities; and to assure that flood fighting activities of the United States Section are coordinated with the responsible officers of the Mexican Section, and of other Federal, State, and local agencies in the United States.

OBJECTIVE

The objective of the United States Section is to provide a basis for sound organization and an action program to save lives and properties from Rio Grande floods. For this purpose, this manual defines:

1. Mission
2. Responsible Officer
3. Operations Center
4. Organization
5. Preparatory Requirements Before Flood Season
6. Alert Actions
7. Requirements and Actions During Flood
8. Photographic Coverage
9. Requirements and Actions After Flood

MISSION

The Mission of the United States Section is to operate the Project jointly with the Mexican Section in order to minimize the loss of lives and properties. In order to carry out this mission the responsible officer will:

a. Ensure all collection of hydrologic information. Provide data and forecasts of the flood and make information available on timely basis;

b. Ensure the necessary field operations are conducted to provide for the security of United States Section project flood levees and proper operations of structures in the floodplain.

c. Ensure that flood operations are properly coordinated with Mexico with respect to diversions from river to the interior floodways in each country, and that releases from Amistad and Falcon Reservoirs provide controlled flood flows in the Rio Grande at the Rio Grande City insofar as possible; and

d. Ensure that the Public Affairs Office provides pertinent information through public releases. Flood data will be exchanged with other federal, state and local agencies with notification through the Public Affairs Office. Ensure that operations and efforts are properly coordinated with affected Federal Agencies, and with States and local authorities.

RESPONSIBLE OFFICER

The person directly responsible for carrying out the mission of the United States Section is the *Principal Engineer, Operations Department,* or his assigned deputy, *Chief Operations* and *Maintenance Division.* They will insure complete coordination and keep the United States Commissioner fully informed.

ORGANIZATION

The organization responsible for coordinating and effecting flood fight activity within the Lower Rio Grande Projects shall consist of the Lower Rio Grande Project Operations and Maintenance (O&M) Forces; designated personnel from the Falcon Hydrographic Office, the El Paso Headquarters, and the Mercedes Field Office and Projects; and such outside forces, equipment, and labor as the circumstances warrant. The Flood Emergency Organization Chart is shown on the next page (**Figure 1)**.

PART A
HYDROGRAPHIC FLOOD OPERATIONS

1. MISSION:

To minimize the loss of lives and property by:

a. Securing and analyzing weather and stream flow data necessary for flood forecasts and operations;

b. Providing advance information on the projected flood conditions; and

c. Documenting the flood conditions for future flood control planning and flood regulation.

2. RESPONSIBLE OFFICER:

The *Chief of Water Accounting Division,* is the responsible officer, and reports to the *Principal Engineer, Operations Department.*

3. OPERATIONS CENTER:

The center of all flood operations associated with the Lower Rio Grande Valley will be located at the Mercedes Field Office. The Field Hydrographic Operations Section will direct and receive all stage and measurements data from the flow measurements parties, check collected data against tabulated and developed rating curves, and plot discharge hydrographs for all river and floodway gaging stations. Contact will be maintained with the Mexican Section to receive all data pertaining to Mexico's river flow and diversion data. Twelve (12) hour shifts will be established to fit the conditions and needs at hand (see **Exhibit 1**).

4. ORGANIZATION:

a. Field Hydrographic Teams: Hydrographic measuring teams will be organized from Mercedes Field Office personnel and other United States Section personnel, as circumstances warrant. A roster of United States Section hydrographic personnel is listed in **Exhibit 2.** These teams will be directed by the Area Operations Manager, Mercedes, and will be based at locations accessible to all gaging stations. **Exhibit 3** lists the equipment required by each team.

b. Communications: Transmission of data will be by the fastest and most reliable method. All available mobile radio units or cellular telephones shall be used to cover the maximum flood area. Reporting of river stages shall be done on hourly intervals unless otherwise directed. See **Exhibit 5**for water stage gages and recording stations.

5. PREPARATORY REQUIREMENTS BEFORE FLOOD SEASON:

Action to be taken **Prior to May 15th of Each Year:**

a. Contact National Weather Service Offices, Brownsville, San Antonio, and Fort Worth, to make arrangements for exchange of data and coordination of forecasts. See **Exhibit 6** for the agency responsibilities per the MOU.

b. Inspect and place in proper operating condition all gaging stations and measuring facilities.

c. Check and service communication and electrical equipment.
    1. Emergency power supply units (Anzalduas, Retamal, and Mercedes).
    2. Auxiliary mobile and base radio units
    3. Remote stage transmitting systems.
    4. Single-side band radio
    5. Cellular telephones, battery chargers, cigarette lighter adapters.
    6. Satellite Telephones

d. Check and service stream gaging equipment.
    1. Bridge and cableway station marking.
    2. Sounding weights
    3. Sounding reels
    4. Sounding cranes
    5. Counter weights
    6. Floodway station recorders
    7. Meter carrying case shall include:
        a. Meter and rating table.
        b. Stop watches
        c. Field note holder
        d. Field note forms (IBWC-5WP-Rev. 10-15-62)
        e. Miscellaneous accessories, tools, and repair and replacement parts.
        f. Ensure that copies of all rating curves, forecast charts, procedures and all other necessary data are updated and placed in the Mercedes Flood Operations Center and provided to the Water Accounting Division in El Paso Headquarters.

e. Assess and ensure all water conveying structures in the levee are operational.

f. Ensure emergency supplies are on site and available; i.e. sand, sand bags, plastic rolls, etc…

g. Review requirements for flood operations of Anzalduas and Retamal Dams with responsible personnel – gate operations will be in accordance with Reservoir Flood Operations Manual and/or special instructions.

h. Contact all licensees to ensure their structures are functional, and headwalls and pilot channels are clean and cleared of debris. A return receipt certified letter will also be mailed to licensees as an official reminder.

6. ALERT ACTIONS:

Whenever a tropical depression, storm, or hurricane is within 160.9 kilometers (100 miles) of Rio Grande watershed, or when rainfall is forecast or reported to be occurring in sufficient quantity to produce a major flood below Dam, the *Chief of Water Accounting Division or his designated representative,* will establish himself at the Flood Operations Center at the Mercedes Office and alerts all hydrographic personnel.

The *Chief of Water Accounting Division or his designated representative,* shall:

a. Obtain and analyze all hydrographic data and provide the *Chief of Project Operations* with river flow forecasts status of all river and rainfall conditions. Keep the *Chief of Project Operations* fully informed of all conditions and data.

b. Maintain all hydrographic data in suitable form within the flood operations center on a current basis to enable and understandable situation reports.

c. Contact National Weather Service Offices in Brownsville, San Antonio, and Fort Worth to exchange meteorological data, flow measurements, and flood forecasts.

d. Alert Mexican Section

The *Area Operations Manager, LRGFCP*, shall:

e. Make assignments to Field Data Collection teams and hydrographic personnel in the Lower Rio Grande Valley.

f. Check measuring and related equipment.

g. Check communications equipment.

h. Have hydrographers check measuring and related equipment while monitoring flood conditions.

i. Make all other necessary arrangements for actions during floods.

7. REQUIRMENTS AND ACTIONS DURING FLOOD:

a. As stage data is observed and collected in the field, it will be relayed as soon as possible to the Flood Center Operations with any new river stages, discharges and rainfall data.

b. Communications – to be fastest available means (cellular telephone, telephone, fax, or radio).

c. Field measurement data is to be transmitted direct to the Flood Center Operations where all data will be recorded on proper forms and relayed to the El Paso Water Accounting Division.

d. Stage and/or discharge hydrographs are to be kept current for analyzing, comparing and forecasting purposes. See **Exhibit 5** for water stage gages and recording stations used for forecasting purposes.

e. Stages discharges relation for the Rio Grande at Los Ebanos will be developed by current measurement up to stage 38.1 meters (125 feet), the top of the high bank on the Mexican side. This will be used for the division of flow in the United States Floodway at Anzalduas Dam and in the Mexican Floodway at Retamal Dam.

f. *The Chief of Water Accounting Division or his designated representative* will prepare, review, and coordinate river forecasts with the National Weather Service every three hours or sooner, if necessary.

g. The *Chief of Water Accounting Division or his designated representative* will ensure that flood information and river forecasts are logged and transmitted as necessary by the *Chief of Flood Center Operations* to each of the following:

    1. *Mercedes Field Office AOM, O&M and Principal Engineering Operations*.
    2. Water Accounting Division, Headquarters, El Paso.
    3. National Weather Service, Brownsville, San Antonio, and Fort Worth (see **Exhibit 6**).
    4. IBWC, Mexican Section, Anzalduas Dam.

h. Stake high water marks (HWM) at the time of the peak stage, or shortly thereafter, at each point, if possible. High water marks should be established near bridge structures, diversion dams, gaging stations, and landmarks along the river and levees.

i. The *Chief of Operations* will arrange for a flood damage survey.

j. Reports of unusual discharges into the river such as; untreated effluent or spills of industrial hazardous waste products should be reported and documented with photographs and a written description to the *Mercedes Field Office AOM, O&M and Principal Engineering Operations* at the end of the day.

k. Adhere to safety procedures as outlined by OSHA regulations to prevent accidents and injuries.

8. PHOTOGRAPHIC COVERAGE

During floods, the *Chief of Project Operations* will determine in consultation with the *Chief of Operations* the extent of aerial photo coverage necessary and make arrangements for securing such documentary evidence, to include oblique as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

9. REQUIRMENTS AND ACTIONS AFTER FLOODS:

a. Elevations and locations of high water marks (HWMs) will be documented by survey crew as soon as possible before the marks are destroyed.

    1. Obtain several HWMs to substantiate the validity of the high water profile.
    2. Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
    3. Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
    4. Indicate the nature of the HWM used such as dirt, and/or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b. Review high water profiles as soon as data are available so questionable elevations can be field checked before marks have been destroyed.

c. A final and comprehensive damage report will be prepared, with the assistance of the Corps of Engineers, if so requested, in accordance with LETTER OF AGREEMENT with that Agency dated September 12, 1968 (see **Exhibit 7**).

d. The Special Operations Division will prepare a final report of the flood from the beginning to the end with critical and constructive suggestions for future reference and guidance.

PART B
LEVEE AND STRUCTURE MAINTENACE OPERATIONS AND OPERATIONS OF DIVERSIONS TO INTERIOR FLOODWAYS

1. MISSION:

To save lives and property:

a. Effecting a flood vigilance and flood fight to ensure the Lower Rio Grande Flood Control Project operates as planned.

b. Maintaining security of United States levees and structures by utilizing Project forces, the employment of contractors, and the use of other agencies' equipment and men.

c. Coordinating operations with other United States Federal, State, County, City Agencies, and other local authorities.

d. Coordinating with Mexico the operation of diversion from the river to the interior floodways; to be implemented through the responsible engineers of the United States Section and the Mexican Section.

2. RESPONSIBLE OFFICER:

The *Area Operations Manager Mercedes* is the responsible officer, and reports to the *Chief of Operations and Maintenance*.

3. OPERATIONS CENTER:

The Center of all flood operations will be located in the Mercedes Office, United States Section, International Boundary and Water Commission.

4. ORGANIZATION:

See **Figure 1** (page 3) for flood organizational chart.

5. PREPARATORY REQUIREMENTS – BEFORE FLOOD SEASON:

Actions to be taken **Prior to June 1st of each year:**

a. Post Flood Warning Notices in local Post Offices and newspaper. (See **Exhibit 8** for an example).
b. Check organization, instructions, supplies, and equipment.

1. Establish 12- hour shifts with assignments to each employee (see **Exhibit 1**.)
2. Make personnel assignments and plans to employ additional men, if needed.
3. Check and service communications and electrical equipment.
    a. Emergency power supply units (Anzalduas, Retamal, and Mercedes).
    b. Auxiliary mobile and base radio units.
    c. Availability of cellular phones.
4. Check equipment and arrange for additional equipment.
5. Check supplies, sandbags, and arrange for additional supplies needed.
6. Instruct all personnel on flood fight methods and operations (see **Exhibit 9 through Exhibit 14**).
7. TRAINING: Periodic classes on gage reading, structure operation, danger signs, and radio communications as well as 24-hour military time system should be conducted for all patrolmen. The general instructions for patrolmen, flood patrols, and flood fighting (see **Exhibit 9 through Exhibit 14)** will be reviewed and discussed with the patrolmen. The Chief of Flood Fighting Operations will make certain that each patrolman knows the sector that he will patrol in the event of a flood. This includes knowing the location and number of gages he will be required to read.

c. Review requirements of operation of Anzalduas Dam with supervisor and operators-gate operations will be in accordance with **FLOOD OPERATIONS CRITERIA MANUAL** and/or special instructions from Headquarters Office (should be agreed upon by both Sections).

d. Sources of Assistance (equipment and men) – check with and obtain from local contractors, water districts, and the Border Patrol, a current list of available equipment and men for use during flood emergency operations (see **Exhibits 18 and 19**).

e. Federal, State, Counties, Cities, Irrigation Districts and other authorities will be contacted and requested to perform the tasks as specifically assigned to them. See **Exhibits 18** for telephone listings and **Exhibit 15** for special responsibilities of other entities.
(1) **Each City** - Conduct an annual joint inspection with each City of all closure devices (slide gates, flap gates, etc.) to ensure proper operation and to provide training to personnel.
(2) **Irrigation Districts and Licensees** - Conduct an annual joint inspection of all closure devices (slide gates, flap gates, etc.) to ensure proper operation and to provide training to personnel.

6. ALERT ACTIONS:

Whenever a tropical depression, storm, or hurricane is within 160.9 kilometers (100 miles) of the Rio Grande watershed, or when rainfall is forecast or reported to be occurring in sufficient

quantity to produce a major flood below Falcon Dam the *Chief of Project Operations* will declare an "ALERT", place all Project personnel on " STAND- BY ALERT" status, and:

a. Commence precautionary measures of securing buildings and equipment.

b. Test emergency generators.

c. Check on the employment of additional people.

d. Test and verify emergency communications system is in operation.

e. Check on availability of contractors' equipment and personnel.

f. Check on the availability of additional flood supplies, such as sandbags and sand.

g. As conditions warrant, alert, inform, and inform, and discuss the situation and responsibilities with other Federal agencies (Weather Bureau, Office of Emergency Planning, Border Patrol, etc.); State agencies (Emergency, Police, and Highway); Local agencies (Counties, Cities, and Water Districts); Railroads; Licensees. **Coordinate the closure of any required storm drains and other gated structures within the Lower Rio Grande Flood Control Project and Irrigation Districts which would cause flooding outside the levee system. (**See **Exhibits 17, 18, and 19** for telephone listings of agencies.)

h. Have Maintenance Personnel close all irrigation structures 48 hours prior to tropical depression, storm or hurricane making landfall.

i. All Mercedes Personnel will not report to work during depression, storm or hurricane landfall. Once depression, storm, or hurricane makes landfall and has completely passed and it is safe to return to work, the personnel shall report to Mercedes Field Office.

7. REQUIREMENTS AND ACTIONS DURING FLOOD

a. IBWC, United States Section – Flood Fight Operations

1. Operate on two 12-hour shifts, as required (see **Exhibit 1**).
2. *Chief of Project Operations* will determine patrol needs and put patrols in operation in their assigned sections to report in **hourly** (or more often if require) on (see **Exhibit 12** for Flood Patrol Sectors):
    a. Gage reading along levee (see **Exhibit 5 and 12**).
    b. Watch for critical sections.
        1. Banker Weir and South Levee of Banker Floodway at Granjeno Bend.
        2. Downstream Mission Closure and 6-Barrel Structure.

3. Hidalgo Loop Levee.
4. Donna Pump area.
5. Divisor Dike.
6. Road and railroad gap closures.

c. Critical Problems:
1. Freeboard.
2. Erosion along levees.
3. Boils or seepage on landside of levee.
4. Erosion at bridges.
5. Structures through levees.

3. Maintenance Crews and equipment will standby as directed by the *Chief, Flood Fight Operations*.
4. Establish sandbagging operations with trucks as needed.

b. Contract Men and Equipment. **Only the *Operations Manager* will arrange for contract work**. The *Operations Manager* will confirm instructions without delay by letter with statement of price.

c. Coordinate flood operations of cities and water districts, and extend possible assistance.

d. Time System – when 24-hour day operations begin, all personnel shall go to a 24-hour military time system, based on local time (see **Exhibit 1**).

e. As water stages rise in the river and within the floodways, maintenance crews will close all the remaining drainage structures to prevent water from leaking out of the floodway system. Patrol Crews will continue to monitor structures and if there is evidence that a structure is leaking, the crews will check for positive or negative flow. Positive flow referring to water flowing into the floodway system and negative flow referring the water flowing out of the floodway system. Crews will check for positive/negative flow by attaching a small weight to a string and lowering it into the structure. The stream current will pull the weight into or away from the floodway. If the weight is pulled away from the floodway, there is negative flow which means water is escaping from the floodway onto the landside. If the weight is pulled into the floodway, there is positive flow and water is flowing into the floodway. This method will be used during the flood and after the flood waters begin to recede. Determinations need to be made on whether a structure is to be opened or closed.

f. All project supervisors will keep log of pertinent events and actions with date, time, location, and description for use in preparing flood reports.

g. Federal, State, Counties, Cities, Irrigation Districts, and other authorities will be contracted and requested to perform the tasks as specifically assigned to them. (See **Exhibits 18 and 19** for telephone listings and **Exhibit 15** for special responsibilities of other entities.)

1. **State of Texas Department of Transportation** – close road crossing on the U.S. and State roads and place fill on low crossing when necessary.
2. **Each City** – close storm drains and other structures, which would cause flooding of City. Maintain local levees (other than Federal levees).
3. **Irrigation Districts and Licensees** – operate drainage structures as assigned.
4. **Each County –** County roads will be closed by County in which they are located.
5. **Railroads** – coordinate with railroads on railroad traffic through floodways and blocking low railroad crossing.
6. **IBWC, United States Section** -will check all river and floodway structures throughout project confirming proper operation.

8. PHOTOGRAPHIC COVERAGE:

During floods, the *Chief of Project Operations* will determine in consultation with the *Chief of Operations* the extend of aerial photo coverage necessary and make arrangements for securing documentary evidence to include oblique as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

9. REQUIREMENTS AND ACTIONS AFTER FLOOD:

a. Elevations and locations of high water marks (HWMs) will be documented by survey crews as soon as possible before the marks are destroyed.
   1. Obtain several HWMs to substantiate the validity of the high water profile.
   2. Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
   3. Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
   4. Indicate the nature of the HWM used such as dirt, and /or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b. Review high water profiles as soon as data is available so questionable elevations can be field checked before marks are destroyed.

c. A final and comprehensive damage report will be prepared, with the assistance of the Corps of Engineers, if so requested, in accordance with the LETTER OF AGREEMENT with that Agency dated September 12, 1968 (see **Exhibit 7**).

d. The *Special Operations Division* will prepare a final report of the flood from the beginning to the end with critical and constructive input for future reference and guidance.

LISTS OF EXHIBITS

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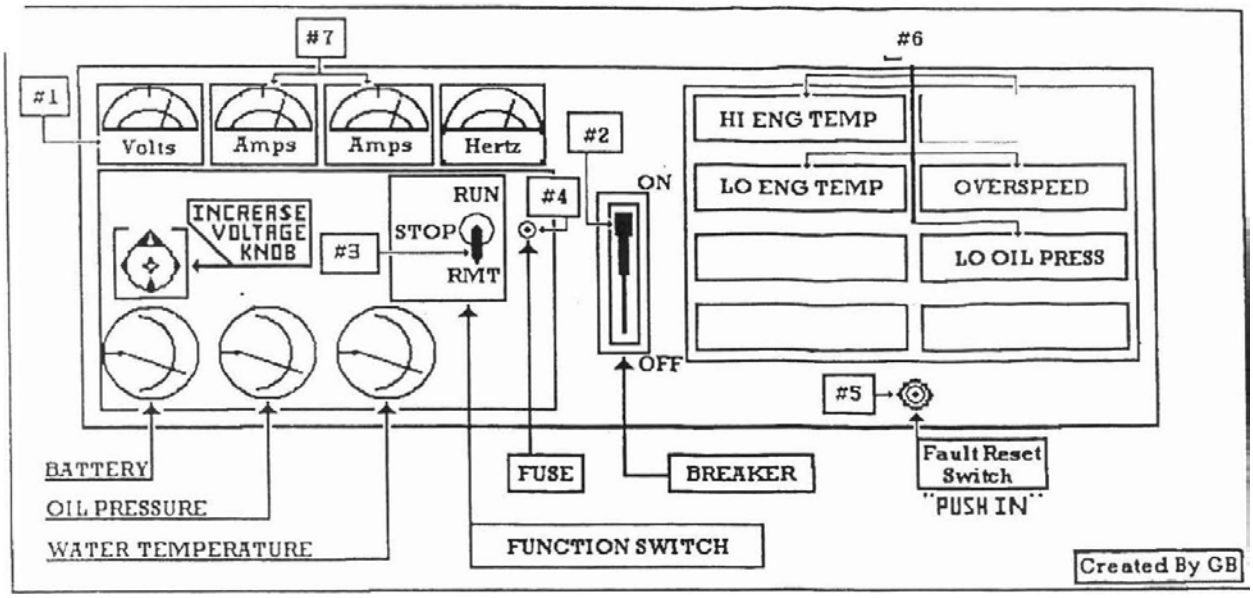
EXHIBIT 1

TENTATIVE 24-HOUR OPERATIONS SCHEDULE

	0600-1800	1800-0600	0800-2000	2000-0800
Field Supervision	R. Munson	J. Segura		
Patrol #1	M. Scott	L. Meza		
Patrol #2	G. Ortiz	L. Martinez		
Patrol # 3	Checked by emergency crews as necessary			
Patrol #4	J. Juarez	H. Palacios		
Patrol #5	D. Rivera	O. Vargas		
Patrol #6	G. Mancillas	O. Aleman		
Patrol #7 & #8	V. Garcia	Ro. Montemayor		
Emergency Crews	G. Ballard			
Heavy Equipment Crews	J. Rodriguez	A. Asevedo		
Shop	A. Martinez J. Medina	J. Jimenez		
Flood Center Warehouse	J. Gomez	J. Saldivar		
Project Administration	R. Montero F. Martinez A. Muñoz J. Elfrink			
Dams Administration			A. Garza	R. Carrera
Anzalduas			C. Chapa E. Berlanga	E. Garcia R. Ramirez
Retamal			M. Gaffner	J. Hutchinson
Hydrographic Personnel	F. Lazo L. Peña J. Bazaldua R. Garcia E. Mendoza J. Negro E. Romero			

EXHIBIT 2A

GENERATOR (Shop) TROUBLESHOOTING



If the Engine does not start,

First check the fuel volume in the Propane tank to the west of the generator room. If the fuel volume is sufficient, check the ball valve on the south side of the engine to insure it is open.

Next, check to see if the engine will turn over with the starter.
If it does not turn over, check to see if there is voltage in the batteries.
If the voltage (11.5VDC-14VDC) is sufficient in the batteries, check to see if there is an engine fault by pressing the FAULT RESET SWITCH (#5) on the control panel. While pressing the FAULT RESET SWITCH, **Five** lights should light (#6), and then engine should turn over and start after the button has been released.

If the aforementioned conditions are correct and there is still a problem, consult qualified personal.

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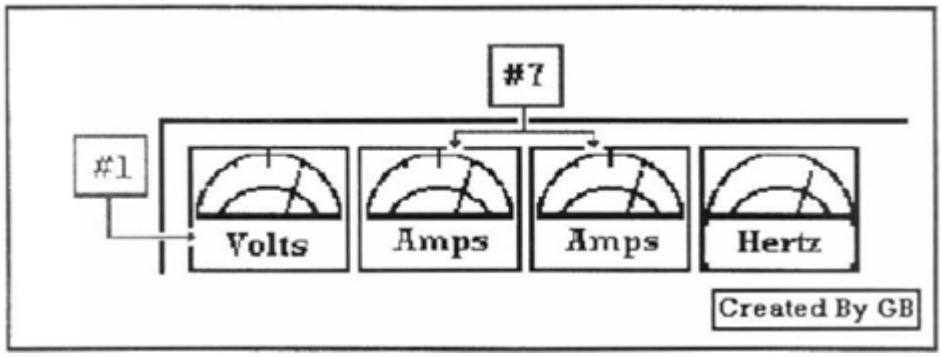
Exhibit 2B

EMERGENCY POWER TRANSFER PRODCEDURE
FOR MERCEDES WORK FORCE SUPPORT BUILDINGS

The work force support buildings are not hooked up to Automatic Transfer Switch. Once the Generator is running the power to the force support buildings must be manually transferred using the following procedures: The generator only supplies 100 Amps of power so the Amp gages must be monitored frequently during generator operations to ensure the generator is not overloaded.



The (R-1) switch is for the Main Shop area.
The (R-2) switch is for the Machine Shop area.
The (R-3) switch is for the Field Office Building area.
The (R-4) switch is for Main CP&L Power and usually will not need to be touched.

Move R-1, R-2, and R-3, Switches from the (Normal) position to the (Open/Off) position and then move each switch separately to the (Emergency) position with about a 1-minute time lag in between.

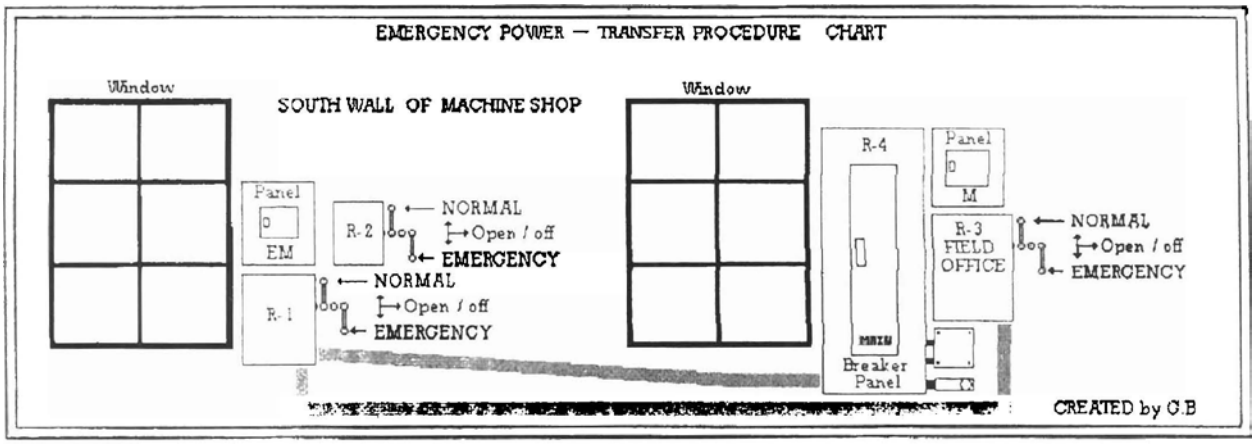


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Exhibit 2C

EMERGENCY GENERATOR OPERATIONS
MAIN OFFICE

This generator is located at the northwest corner of the Administration Building behind the back door of the Engineering Office. This generator is fully automatic and provides all power required by the Administrative Office and Flood Control Center. Shop personnel are responsible for ensuring that the generator has sufficient fuel, oil, and water. Generator operations can be verified by checking the transfer switches located on the inside west wall of the Engineering Office. The switches have lighted indicators showing the mode that the generator is operating in i.e. **Emergency power or Utility power**.

If there is engine failure or any other problem contract the duty shop personnel.

EXHIBIT 3
EQUIPMENT UTILIZED BY EACH MEASURING TEAM

MEASURING EQUIPMENT:

Each Hydrographer Team shall be equipped as follows:

Amount	Equipment
1	Radio-equipped pickup with trailer hitch
2	Current meters with rating and vertical angle correction tables
1	B-50 reel
1	Type "A" Crane (attached to 4-wheel base as available)
1	Plug-in floodlight
1	Flashing lantern and spotlight
1	Water Can
	Emergency rations
	Necessary tools, measurements note blanks, and personal gear, boots, drag lines, raincoats, wading equipment, etc. Power winch equipment and/or boat and boat equipment to be added in accordance with needs.

NOTE: All pickups to be equipped with standard size (1 7/8") ball hitch. All boat trailers to be standardized for hookup.

MOTOR BOATS:

Boats designated for "FLOOD USE" shall be a minimum twelve (12') feet in length, be equipped with at least a fourteen (14 H.P.) horsepower motor and carry the following equipment:

Amount	Equipment
1	Boat tagline and measuring boom
2	Life preservers
3	Oars
1	Anchor
1	Toolbox with extra propeller, shear pins, and other motor accessories, flagging range, finder, etc.

IT SHALL BE THE RESPONSIBILITY OF AN EXPERIENCED SUPERVISOR TO DETERMINE THE FEASIBILTY AND SAFETY CONCERNING OPERATION OF A BOAT IN WATERS AT FLOOD STAGE TAKING INTO ACCOUNT THE VELOCITY, DEBRIS, EXPERIENCE OF BOATMEN, ETC.

EXHIBIT 4A

Mercedes to Arroyo City 470460

1. Head west on Golf Course Rd toward S Mile 2 West Rd	go 0.1 mile
2. Turn right onto S Mile 2 West Rd	go 1.5 miles
3. Turn right onto U.S. 83 Frontage Rd S	go 0.9 mile
4. Take the ramp on the left onto US-83 E	go 20.0 miles
5. Take the exit toward TX-345/ Farm to Market Rd 2520 Sam Houston Blvd/ McCulloch St	go 466 feet
6. Merge onto W Expy 83/ Frontage Rd	
7. Turn left onto TX-345 N/ S Sam Houston Blvd	go 8.8 miles
8. Turn right onto Colorado Ave/ County Rd 106 -Continue to follow County Rd 106	go 2.2 miles
9. Turn left onto E Brown Tract Rd/ County Rd 2925 -Continue to follow County Rd 2925	go 11.0 miles
10. Destination will be on the left	
11. Welcome to Arroyo City 470460	

Estimated travel time = 1 hour 15 minutes

EXHIBIT 4B

Mercedes to Banker 468500

1. Head west on Golf Course Rd toward S Mile 2 West Rd	go 0.1 miles
2. Turn right onto S Mile 2 West Rd	go 1.6 miles
3. Turn left onto W Expy 83/US-83 Frontage Rd	go 0.7 miles
4. Take the ramp on the left onto US-83 W	go 20.7 miles
5. Take the exit toward Farm to Market Rd 494/Shary Rd	go 0.2 miles
6. Merge onto W Expy 83/US-83 Frontage Rd	go 1.2 miles
7. Turn left onto Farm-To-Market Rd 494/S Shary Rd -Continue to follow Farm-To-Market Rd 494	go 4.3 miles
8. Turn left onto El Camino Real St	go 0.3 miles
9. Head west on El Camino Real St toward Anzalduas Dr	go 0.3 miles
10. Turn left onto S Farm-To-Market Rd 494/ Military Rd	go 0.9 miles
11. Turn left onto 5494 Wing	go 0.4 miles
12. Take the 1st left onto Anzalduas Dam Rd -Destination will be at Anzalduas Park	go 1.1 miles
13. Once at Anzalduas Dam Rd - go straight and you will see the station across from the floodway.	
14. Take road going into floodway.	
15. Welcome to Banker 468500.	

Be advised that during a flood, you will need to take the south levee off 23rd St. in Mcallen, TX.

Estimated travel time = 40 minutes

EXHIBIT 4C

Mercedes to Below Anzalduas

1. Head west on Golf Course Rd toward S Mile 2 West Rd	go 0.1 miles
2. Turn right onto S Mile 2 West Rd	go 1.6 miles
3. Turn left onto W Expy 83/ US-83 Frontage Rd	go 0.7 miles
4. Take the ramp on the left onto US-83 W	go 20.7 miles
5. Take the exit toward Farm to Market Rd 494/ Shary Rd	go 0.2 miles
6. Merge onto W Expy 83/ US-83 Frontage Rd	go 1.2 miles
7. Turn left onto Farm-To-Market Rd 494/ S Shary Rd	go 4.3 miles
Continue to follow Farm-To-Market Rd 494	
8. Turn left onto El Camino Real St	go 0.3 miles
9. Head west on El Camino Real St toward Anzaldua Dr	go 0.3 miles
10. Turn left onto S Farm-To-Market Rd 494/ Military Rd	go 0.9 miles
11. Turn left onto 5494 Wing	go 0.4 miles
12. Take the 1st left onto Anzalduas Dam Rd	go 1.1 miles
Destination will be Anzaldua Park	
13. Once on Anzalduas Dam Rd., go straight and you will see the Banker station across floodway.	
14. Take road going into floodway.	
15. Drive up to Banker & south towards Dam.	
16. Take first left off levee.	
17. Take dirt road all the way to the river. You will see a gate to left.	
18. Go through the gate and drive approximately 0.25 miles. Welcome to Below Anzalduas Dam. (station cableway only)	

Estimated travel time = 45 minutes

LOWER RIO GRANDE VALLEY GAGE BOARDS
EXHIBITS 5A & 5B

GAGE BOARD WITH LETTERS "2005"
EXHIBIT – 5A

A. Main Floodway, North Levee, @, gaging stations, upstream Valley View Rd.
B. River Levee, gaging station downstream of Los Ebanos ferry.
C. North Floodway, North Levee, Llano Grande gaging station, upstream Golf Course Rd.
D. Arroyo Floodway, gaging station @ Arroyo City, next to boat ramp.
E.
F.
G.
H.
I. River Levee, Retamal Dam, tail water gages.
J. River Levee, San Benito Gaging Station.
K. River Levee, B&M Bridge, downstream side
L. River Levee, Gateway Int. Bridge, High gage-downstream, Low gage- downstream.
M. River Levee, Brownsville Gaging Station (El Jardin).
M-IA River Levee, upstream from Retamal Dam, across from Mexican weir on river bank.
M-IB River Levee, upstream from Retamal Dam, across from Mexican weir next to levee.
N. Bankers weir, north levee upstream from weir.
O.
P. Main Floodway, North Levee,, downstream of FM 88 bridge.
Q.
R. North Floodway, Bus. 83 bridge, east side, upstream side.
S. North Floodway, Exp. 77 bridge, downstream side, south levee.
T. Arroyo Floodway, gaging station @ El Fuste.
U. Arroyo Floodway, Exp. 83/77 downstream from bridges on the north bank off the westbound Frontage Road. (F Street).
V.
W. Arroyo Floodway, gaging station @ Rio Hondo bridge.
X.
Y.
Z.

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GAGE BOARDS WITH NUMBERS “2005”
EXHIBIT – 5B

1 River Levee, Penitas 2 Str.#297 (downstream from pump).
2 River Levee, United Irrigation District (7&14) upstream from canal.
3 River Levee, downstream Str.#325 in Hidalgo Loop Levee.
4 River Levee, upstream Hidalgo-Reynosa bridge.
4A River Levee, upstream side of Pharr-San Juan pump.
5 River Levee, upstream Side Donna Pump.
6 River Levee, high gage upstream side, low gage under Progreso Bridge.
7 River Levee, H. Rodriguez Road (IBC Road) 1 gage by levee, 2 others behind pump house.
8 River Levee, Nye Sugar Plantation, near Str#242, behind storage buildings. Pulled out but has not been replaced.
9 Main Floodway, North Levee @23rd St.
10 Main Floodway, North Levee, upstream US 281.
11 Main Floodway, North Levee, downstream @FM 907.
12 Main Floodway, South Levee, downstream FM 1015.
13 South Levee and Divisor Dike @ DM 506.
14 Arroyo Floodway, North Levee, upstream of FM 491 @ Str#167.
15 Arroyo Floodway, South Levee, downstream of FM 506.
16 Arroyo Floodway, South Levee, 1000 feet upstream from end of levee @ Str#423.
17 Arroyo Floodway, Northwest bank, downstream Bus. Hwy 77 bridge.
18 Arroyo Floodway, Southwest bank, upstream of bridge @ loop 499.
19 North Floodway, North Levee, downstream Mile 12 N.
20 North Floodway, South Levee, downstream FM 107.
21 North Floodway, South Levee, upstream FM 507.
22 North Floodway, South Levee, downstream FM 1420.
23 North Floodway, South Levee. @ King Ranch gate.
24 River Levee, Los Indios bridge, upstream side of bridge.
25 Arroyo Floodway, Northwest side of FM 509 bridge, on bridge piling.
26
27
28
29
30

REV: 05/12

EXHIBIT 6
MEMORANDUM OF UNDERSTANDING BETWEEN
THE NATIONAL WEATHER SERVICE AND THE IBWC

MEMORANDUM OF UNDERSTANDING
BETWEEN THE
UNITED STATES SECTION,
INTERNATIONAL BOUNDARY AND WATER COMMISSION,
UNITED STATES AND MEXICO
AND THE
SOUTHERN REGION, NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Article I. Background and Purpose

The United States Section, International Boundary and Water Commission, United States and Mexico, an instrumentality of the United States federal government (hereinafter referred to as USIBWC) and the National Weather Service Southern Region of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce (hereinafter referred to as NWS), together referred to as the Parties, have mutually supportive responsibilities for enhancing water resource management and flood forecast and warning services in the lower Rio Grande Valley.

The International Boundary and Water Commission, United States and Mexico is an officially recognized international organization pursuant to Executive Order 12467, and in which the United States participates pursuant to 22 U.S.C. Section 277 et seq., and inter alia the 1889 International Boundary Convention (26 Stat.1512) and 1944 Treaty between the United States and Mexico for the "Utilization of Waters of the Colorado, Tijuana and Rio Grande Rivers" (59 Stat. 1219) (the "1944 Treaty")

The mission of the USIBWC is to provide sensitive, timely, and fiscally responsible boundary, water, and environmental services along the United States and Mexico border. These services are provided in an atmosphere of binational cooperation and in a manner responsible to public and stakeholder concerns. The types of activities assigned to the USIBWC by international agreement and federal statue include water accounting and diversion of entitlements to international rivers and streams, water quality, sanitation issues, flood protection, and establishment and maintenance of the boundary between the United States and Mexico. The USIBWC manages the water resources of that portion of the main stem of the Rio Grande that forms the international boundary.

The mission of the NWS is to provide weather, hydrologic, and climate forecasts and warnings for ten states in the southern U.S., including the Commonwealth of Puerto Rico, the Virgin Islands, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

The purpose of this Memorandum of Understanding (MOU) is to establish a framework for cooperation and coordination between the USIBWC and the NWS. This MOU is designed to make it easier for USIBWC and NWS hydrologists and meteorologists to work together, when appropriate, in addressing the needs for water management in the Lower Rio Grande Valley.

Article II. Scope

This MOU serves as an agreement that sets forth the general terms and conditions under which the Parties will coordinate and cooperate in activities involving water management in the Lower Rio Grande Valley. Cooperative activities in these fields may include, but are not limited to, exchange of technical information and services, joint studies of mutual interest, joint educational activities to advance understanding of water management in the Lower Rio Grande Valley, and exchange visits of individuals sponsored by either Party.

Article III. Agreements/Responsibilities

The Parties agree to endeavor to:

- Cooperate in mutual areas of interest and share data, information, and findings of mutual concern;
- Share data in agreed upon formats to support each agency's hydrologic operations;
- Cooperate and support the operation of all programs of mutual interest;
- Rotate hosting an annual USIBWC/NWS meeting;
- Exchange personnel rosters at the annual meeting.

The USIBWC will:

- Relay Mexican and U.S. river flows, rainfall, reservoir elevations, reservoir storage and reservoir discharge data during a flood event to the appropriate NWS Weather Forecast Offices (WFOs).

- Participate in teleconferences hosted by the Texas Department of Emergency Management to discuss the flood impacts and emergency response measures being taken during significant flood events along the Rio Grande. The USIBWC will address technical questions about the international reservoirs (Amistad and Falcon), reservoir operations, pool height projections, and expected releases (controlled or otherwise).

- Issue news media releases concerning actual or anticipated flood operations involving the international dams, and diversions of flood flows into the United States interior floodways in the Lower Rio Grande Valley.

- Provide the WFOs and the NWS West Gulf River Forecast Center (WGRFC) with information about (1) potential or imminent dam failures for structures owned by the USIBWC; (2) significant reservoir release information at identified sites which exceed agreed upon thresholds; and (3) tabletop exercises for dam failures/flood operations.

- Include NWS point-of-contact information in the Emergency Action Plans for Amistad and Falcon Dams.

- Through their headquarters, cooperate with the WGRFC in the formulation of river forecasts.

The NWS will:

- Through the WGRFC, generate river and reservoir inflow forecasts, to the extent that hydrologic information allows, for the Rio Grande main stem and its major U.S. tributaries.

- Through the WGRFC, provide simulated reservoir elevation forecasts for Amistad and Falcon reservoirs at the request of USIBWC.

- Through the WFOs, disseminate river flood warnings, when required, for the main stem and United States tributaries and floodways of the lower Rio Grande.

- Through the WFOs and the WGRFC, provide information on rainfall amounts (observed, radar estimated, multi-sensor) in the Rio Grande Basin, including Mexico.

- The WGRFC will serve as a primary contact to USIBWC for hydrologic forecast information, providing briefings to USIBWC staff, as necessary.

- Through the WFOs, provide the USIBWC with monthly flood summary reports.

- Through the WFOs, coordinate with the USIBWC before making press releases/public information statements, regarding flood operations involving the international dams and interior floodways in the Lower Rio Grande Valley if such releases are a necessary part of the public flood warning.

- Disseminate river forecasts in both English and Metric units.

Article IV. Implementation

Updates on program activities, technology application, and development and related work pertaining to cooperative activities pursued under this MOU, will occur through written correspondence, electronic transmittal of data, individual communication, USIBWC/NWS coordination meetings held at least once per year, and other mechanisms.

The point of contact with the USIBWC for this MOU is the Commissioner, USIBWC, or his or her designee. The point of contact with NWS for this MOU is the Director, Southern Region, or his or her designee.

Article V. Financial Arrangements

This MOU is neither a fiscal nor funds obligation document. Any activities involving reimbursement or contribution of funds between the parties of this MOU will be handled in accordance with applicable laws, regulations, and procedures. Such activities will be documented in specific reimbursable agreements pursuant to the Economy Act, 31 U.S.C. Section 1535 or other applicable authorities. The separate agreements will reference this MOU. This MOU does not establish authority for noncompetitive award among the Parties for any contract or other agreement.

This MOU defines in general terms the basis on which the Parties will cooperate, and as such, does not constitute a financial obligation to serve as a basis for expenditures. Expenditures of funds, human resources, equipment, supplies, facilities, training, public information, and expertise will be provided by each signatory agency to the extent that their participation is required and resources are available.

This MOU in no way restricts the Parties from participating in similar activities or arrangements with other public or private agencies, organizations, or individuals.

This MOU does not obligate the Parties to expend appropriations on any particular project or purpose or to enter into any agreements, contracts, or other obligations, even if funds are available.

Article VI. Terms of Understanding

Effective date: This MOU shall take effect upon the date of the last signature.

Modification: This MOU may be renegotiated, amended, or modified at any time by mutual agreement of the Parties.

Termination: This MOU shall remain in effect for a period of five (5) years from the date of the last signature. This MOU may be terminated by either agency by providing written notice and explanation to the other agency at least 90 calendar days in advance of the effective date of termination. The termination of this MOU shall not affect the validity or duration of activities or agreements under this MOU, which are initiated prior to each termination.

Review: This MOU shall be reviewed annually at the regularly scheduled USIBWC/NWS coordination meeting.

Renewal: This MOU may be renewed for additional periods of 5 years, by mutual written consent of the Parties.

Article VII. Authorities

The authorities of the USIBWC to enter into this MOU include:

- International Boundary and Water Commission Authority (22 U.S.C. Section 277 et seq.)

The authorities of NOAA to enter into this MOU include:

- Department of Commerce (NOAA) Authority (33 U.S.C. § 883a et seq.)
- National Weather Service Organic Authority (15 U.S.C. § 313)

Article VIII. Publications and Release of Information

Publications documenting cooperative efforts may be prepared by either Party, or jointly, provided that both parties have an opportunity to review manuscripts prior to publication. To the extent possible, decisions involving authorship, review of reports, and other conditions and circumstances will be addressed during the preparation of Interagency Agreements referencing this MOU.

Should differences of viewpoint exist between the Parties, an effort should be made to reconcile them. However, this shall not prohibit either agency from publishing the data or information provided it assumes sole responsibility and gives appropriate credit to the other agency. Neither NWS nor the USIBWC will make editorial changes to the portions of joint documents drafted by the other agency without full knowledge and consent of the other party.

The Parties agree that sharing credit is mutually beneficial, and will make every effort to assure that appropriate citation and attribution, including the use of official agency visual identifiers, is given for work performed under this MOU.

Publicity and Public Information Products, including news releases, reports, briefing papers, or other information products, are subject to the same terms and conditions as other publications as stated above.

Any commitment of either party to preserve the confidentiality of information is subject to applicable United States laws and regulations.

Article IX. Authorized representatives

Authorized officials to enter into Interagency Agreements referencing this MOU are identified in Agency Manuals.

Article X. Approval

United States Section U. S. International Boundary and Water Commission U. S. Department of State		Southern Region National Weather Service National Oceanic and Atmospheric Administration U.S. Department of Commerce	
Signature:		Signature:	
Name:	Carlos Marin	Name:	Bill Proenza
Title:	Commissioner, International Boundary and Water Commission, U.S. Section	Title:	Director, National Weather Service, Southern Region
Date	April 29, 2008	Date:	April 21, 2008

Addendum – NWS/USIBWC Coordination

When heavy rainfall is observed from ground-based observations/radar, reports of flooding are received, or the NWS forecasts significant flows, the NWS will contact the appropriate USIBWC Office as follows:

(a) WFO El Paso will notify USIBWC Headquarters in El Paso for the Rio Grande drainage from El Paso downstream to Candelaria, and also serve as an Internet point of contact for hydrometeorological information.

(b) WFO Midland will notify the USIBWC Office at Presidio and El Paso Headquarters for the drainage from Candelaria downstream to Heath Canyon at the La Linda Bridge. This includes the Conchos River drainage in Mexico from Luis Leon Reservoir downstream to the Rio Grande at Presidio. WFO Midland will notify the USIBWC Office at Amistad Dam for the drainage below Heath Canyon at the La Linda Bridge downstream to, and including Dryden.

(c) WFO Austin/San Antonio will notify USIBWC Office at Amistad Dam and the El Paso Headquarters for the drainage below Dryden, including the lower Pecos River, and the Devils River tributaries to Lake Amistad. WFO Austin/San Antonio responsibility extends southward to the San Antonio Crossing gage on the main stem, and includes the Mexican tributaries.

(d) WFO Corpus Christi will notify USIBWC Office at Falcon Dam and the El Paso Headquarters for the drainage ranging from Palafox southward to Columbia Bridge and below Laredo to the Webb-Zapata county line.

(e) WFO Brownsville will notify USIBWC Office at Falcon Dam, Mercedes, and El Paso Headquarters for the drainage from the Webb-Zapata county line Falcon Lake (including the Salado and San Juan River systems in Mexico) southward through the Lower Valley Floodway to the mouth of the Rio Grande.

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES SECTION

2011 PERSONNEL ROSTER
5 U.S.C. 552(B)(7)(E) AND (F)

fices

Presidio Project

NATIONAL WEATHER SERVICE OFFICES

CONTACT POINTS FOR IBWC COORDINATION

June 2008

Climate, Water, and Weather Division

5 U.S.C. 552(B)(7)(E) AND (F)

5 U.S.C. 552(B)(7)(E) AND (F)

5 U.S.C. 552(B)(7)(E) AND (F)

5 U.S.C. 552(B)(7)(E) AND (F)

EXHIBIT 7
MEMORDANDUM OF UNDERSTNADING BETWEEN
THE CORPS OF ENGINEERS AND THE IBWC

DUPLICATE ORIGINAL

MEMORANDUM OF UNDERSTANDING BETWEEN SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS AND UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO

This Memorandum of Understanding entered into this 27th day of November 1990, between the Southwestern Division, U. S. Army Corps of Engineers, hereinafter referred to as the "Corps", and the United States Section, International Boundary and Water Commission, United States and Mexico, hereinafter referred to as the "United States Section", WITNESSETH:

WHEREAS, the United States Section is authorized under 22 U.S.C.A. Sec. 277a, as amended, to construct, operate and maintain flood control works on the Rio Grande, and is authorized under 22 U.S.C.A. Sec. 277d-12, as amended, to expend from appropriations available to it such sums as may be necessary for prosecution of emergency flood fighting and rescue operations, repairs or restoration of any flood control works threatened or destroyed by floodwaters of the Rio Grande; and

WHEREAS, the Corps has authority under 33 U.S.C.A. Sec. 701n, as amended, to expend funds and engage in emergency flood fighting, rescue operations, and repairs or restoration of any flood control works threatened or destroyed by floods, including the strengthening, raising, extending, or other modifications thereof as may be necessary in the discretion of the Chief of Engineers for the adequate functioning of the work for flood control; and

WHEREAS, in order that all domestic obligations and functions prescribed by said laws and all international responsibilities of the United States Section may be coordinated and fulfilled in the manner contemplated, it is considered to be mutually desirable to define and set forth the specific jurisdiction and functions to be exercised by the United States Section and the Corps with respect to the Rio Grande and its tributaries in the States of New Mexico and Texas.

NOW, THEREFORE, the parties hereto agree as follows:

1. The United States Section shall be the responsible agency to prosecute emergency flood fighting and rescue

operations, repairs or restoration of any flood control works of the Rio Grande (and for coordination of such activities as may be necessary with authorities of the Mexican Section of the International Boundary and Water Commission), as follows:

(a) On the main stem of the Rio Grande from Caballo Dam to the beginning of the international boundary at El Paso, Texas; then downstream to the mouth of the Rio Grande at the Gulf of Mexico, including 96 miles of river levees of the Lower Rio Grande Flood Control Project from Penitas, Texas to a point 15 miles below Brownsville, Texas.

(b) Interior floodways of the Lower Rio Grande Flood Control Project, extending 137 miles in length.

2. The Corps shall have the responsibility for flood emergency preparation, flood fighting, rescue operations, and the repair and restoration of any flood control work threatened or destroyed by floodwaters on tributaries of the Rio Grande below Caballo Dam.

3. The flood fighting resources of the Corps and the United States Section shall be available to one another upon request for such assistance. For such purpose, it is agreed that the following principles and procedures will, to the extent practicable, govern cooperation between the parties hereto:

(a) During emergencies, close liaison will be maintained between Principal Engineer of the United States Section and the appropriate Corps District Commander, or his designated representative, for the exchange of all pertinent information and basic hydrologic data.

(b) If so requested by the United States Section, assistance of the Corps will be furnished, on a cost-reimbursable basis, by the Albuquerque Engineer District in the reach of the Rio Grande from Caballo Dam to the mouth of the Pecos River; by the Fort Worth Engineer District in the reach from the mouth of the Pecos River to Falcon Dam; and by the Galveston Engineer District from Falcon Dam to the Gulf of Mexico.

(c) If so requested by the Corps, assistance will be furnished, on a cost-reimbursable basis, by authority and approval of the El Paso Headquarters of the United States Section for tributaries along reaches of the Rio Grande below Caballo Dam in the United States under jurisdiction of the said Corps.

DUPLICATE ORIGINAL

(d) Each District Commander of the Corps will designate an assistant who will represent his District in all contacts with the United States Section. The Commissioner of the United States Section will designate his representatives for all contacts with the Engineer Districts of the Corps.

(e) Each party to this Understanding will endeavor to provide the closest association and maximum cooperation and participation possible under the laws, regulations, and responsibilities governing it.

(f) It is understood that available forces of the Corps will continue, as in the past, to perform rescue work when, through any circumstance, such forces are the only ones in proximity to a scene of immediate need on the Rio Grande and interior floodways of the Lower Rio Grande Flood Control Project under the jurisdiction of the United States Section.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the date first hereinabove stated.

UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, El Paso, Texas

By _____
Dr. Narendra N. Gunaji, Commissioner

SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS, Dallas, Texas

By _____
Stanley G. Genega
Brigadier General, U.S. Army
Commanding General

EXHIBIT 8
FLOOD WARNING NOTICE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

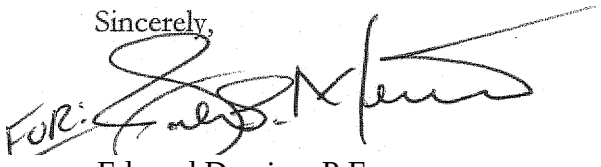
A notice to the general public, all owners, lessees, and users of lands along the Rio Grande, in the reach from Penitas to the Gulf and in the interior floodways in Hidalgo, Cameron, and Willacy Counties, Texas

The general public, owners, lessees, and users of lands on the United States banks of the Rio Grande, below Falcon Dam or lands within the Banker Floodway, Main Floodway, Arroyo Colorado, and North Floodway, are hereby notified that lands along the banks of the river, depending upon their elevation, are subject to periodic flooding from local tributary inflows and by releases from Falcon Reservoir. This notice is given as a public service to advise and inform you that human life, property, livestock, and other activities, existing or proposed, may be subject to flood damage, and are maintained or undertaken at your own risk.

The United States Section, International Boundary and Water Commission (USIBWC) maintains the Lower Rio Grande Flood Control Project to provide flood protection to urban, suburban, and highly developed irrigated lands in the Rio Grande delta in both countries. The USIBWC will operate Falcon Dam during flood conditions to regulate and safely convey normal and flood flows. Please be advised that during flood releases from Falcon Dam and/or localized heavy rainfall/runoff events, the Rio Grande will unavoidably overflow its channel and may adversely impact interests along its banks. Please refer to your local National Weather Service office for flood information during these events.

In order to protect life and property and to avoid potential obstruction or deflection of flows within the Rio Grande floodplain, the general public, owners, lessees, and users of land along the Rio Grande are advised for their own safety and for security of their properties to contact your Hidalgo, Cameron, and Willacy County Officials and the USIBWC, 325 Golf Course Road, Mercedes, TX 78570, telephone number (956) 565-3150, before making any use of the lands or constructing improvements on the lands along the river.

Sincerely,



Edward Drusina, P.E.
Commissioner

EXHIBIT 9
GENERAL INSTRUCTIONS FOR PATROLMEN

1. Each person involved must realize the extreme importance and responsibilities of his part/position in the flood fighting organization.

2. Patrolmen should be familiar with their assigned patrol sector and check for necessary supplies before leaving on patrol. Detailed instructions and structure locations can be found in the Master Flood Patrol "Red Book", located at the Mercedes Field Office.

3. Each man on patrol, as well as others, should be alerted and instructed to observe, record, and report:

    a. Progressive flood stages.
    b. Boils and seeps on the landside of levees and dikes.
    c. Slope and crown erosion from waves and currents.
    d. Structures' condition and proper operation of same.
    e. Pumping across levee into floodway- watch for levee erosion and pipes that should be covered to permit traffic over them.
    f. Watch levee freeboard-report any condition that isles than four (4') feet measured vertically.
    g. Caution-do not block any railroads until Mercedes Office has notified the railroad officials.

4. Observe at all times the safety rules and safety program.

5. Assure that equipment is at all times serviced, fueled, and ready to go at a moment's notice. It will be management's responsibility to see that equipment is strategically place.

6. Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sighting or condition, however seemingly unimportant.

7. Each patrolman should not leave his post or assigned patrol sector until relieved, unless instructed otherwise.

    a. Each patrol unit will be furnished a log book. All gage readings, problems, emergency situations, etc. should be recorded, together with time and date. Each patrolman should sign the log book at the end of his shift.
    b. Upon being relieved, he will pass on to his relief: the log book, the present situation prevailing in his particular sector, any particular work instructions that are to be carried out during the past shift.
    c. Each patrolman shall be expected and prepared to be "double shift" if an emergency should require.

8. Patrol areas and special instructions regarding Patrol Sector are found in **Exhibit 12, "Flood Patrol Sector"**.

Exhibit 10
RECOMMENDED FLOOD FIGHT TRAINING

All Projects, as applicable should give proper training on the following subjects:

1. Gage Reading.

2. Structure Operation. (Confined space training by Safety Officer)

3. Danger Signs.

4. Operation of Radios and Other Communication Systems.

5. 24-Hour Military Time System.

6. General Instructions for Flood Patrols:

    a. Patrol Sectors.
    b. Times of Shifts.
    c. Location and Number of Gages to be Read.

7. Operation of Dams to be Reviewed by Supervisors with Dam Operators.

8. Safety Equipment and Procedures.

9. Flood Alert Exercises.

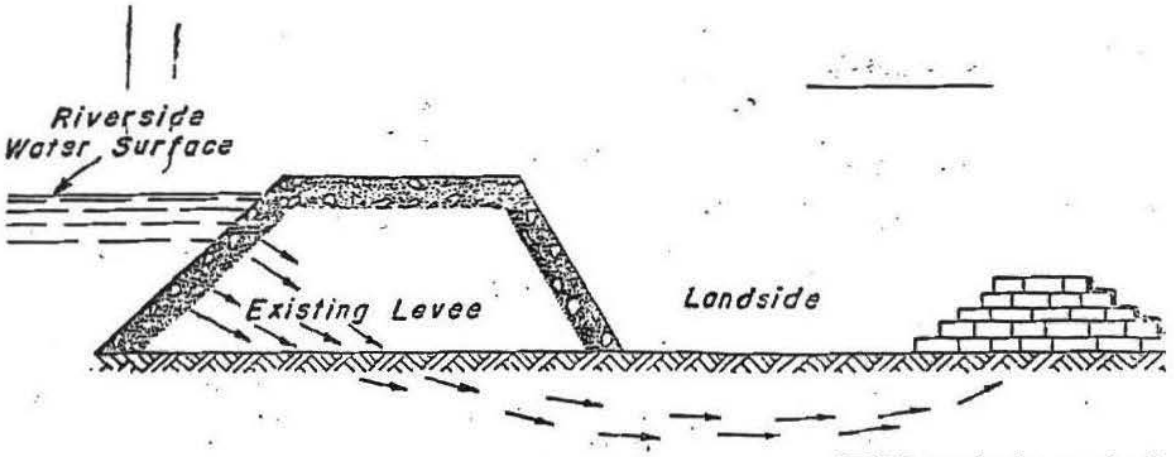
10. Flood Fight Procedures:

    a. Control Sand Boils.
    b. Wave Wash and Current Erosion.
    c. Overtopping of Levees.

EXHIBIT 11
FLOOD FIGHT METHODS

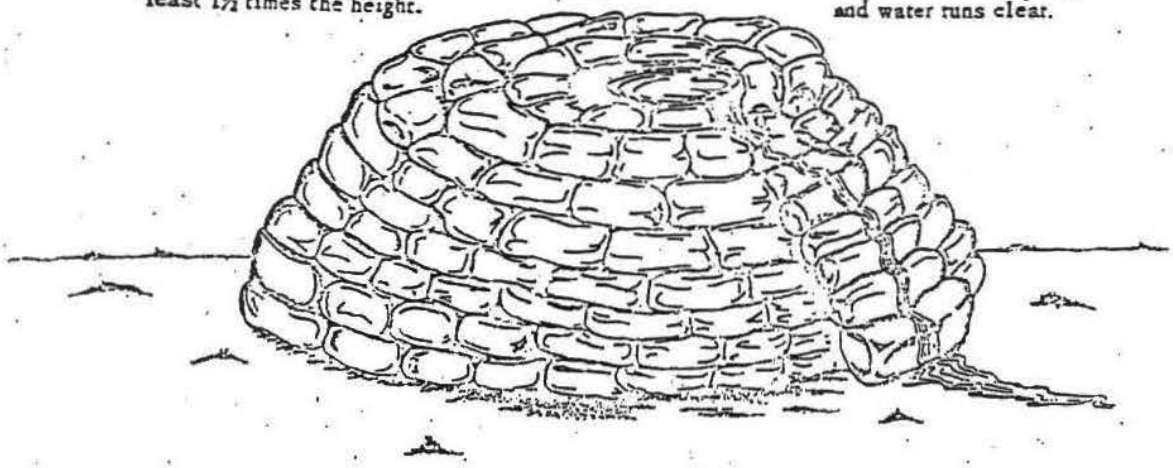
METHODS

1. Control of Sand Boils
2. Wave Wash Protection
3. Control of Current Scouring
4. Additional Use of Sandbags
5. Control of Levee Overtopping



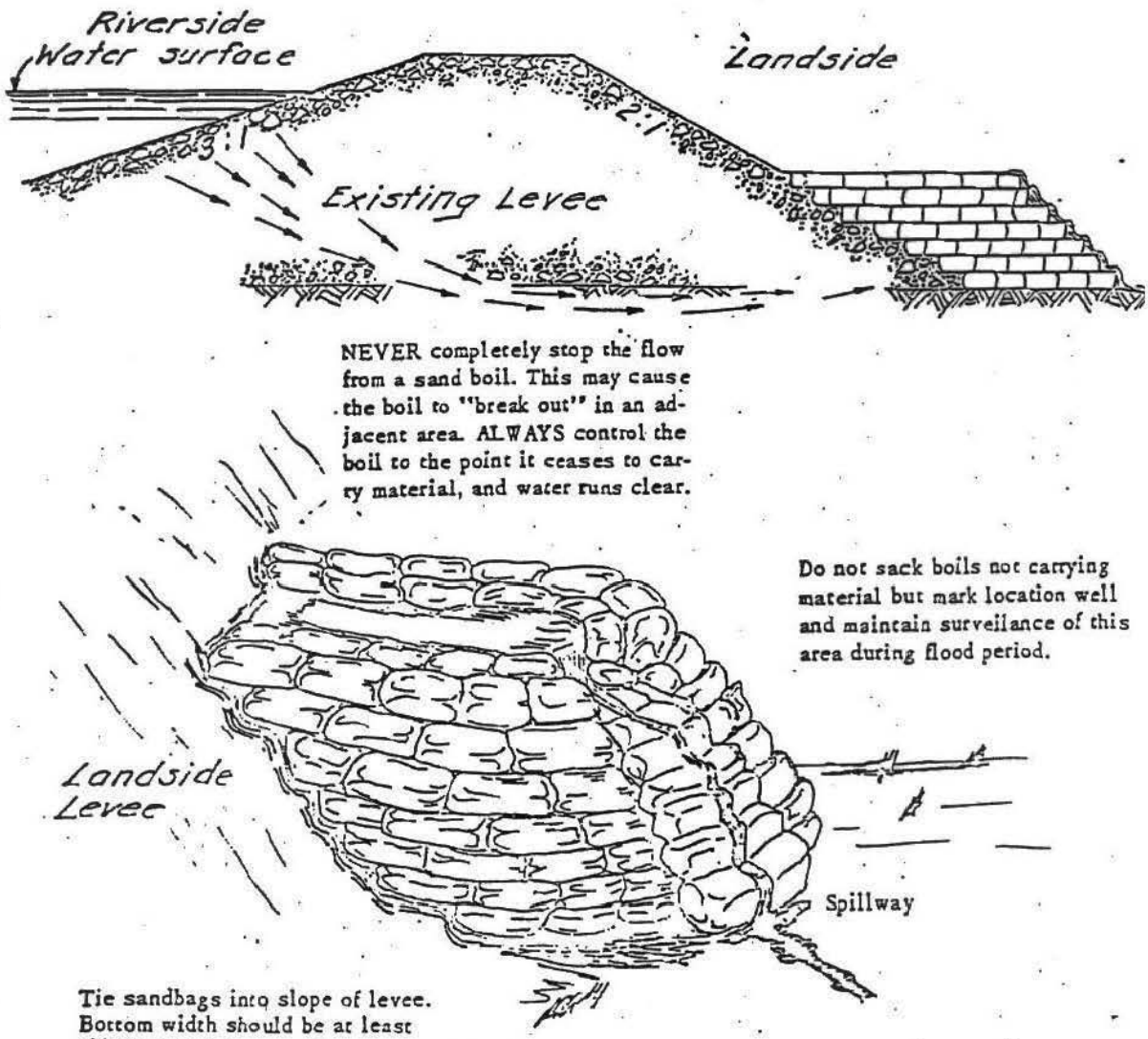
NEVER completely stop the flo
from a sand boil. This may cau
the boil to "break out" in an a
jacent area.
ALWAYS control the boil to the
point it ceases to carry materia
and water runs clear.

Bottom width should be at
least 1½ times the height.



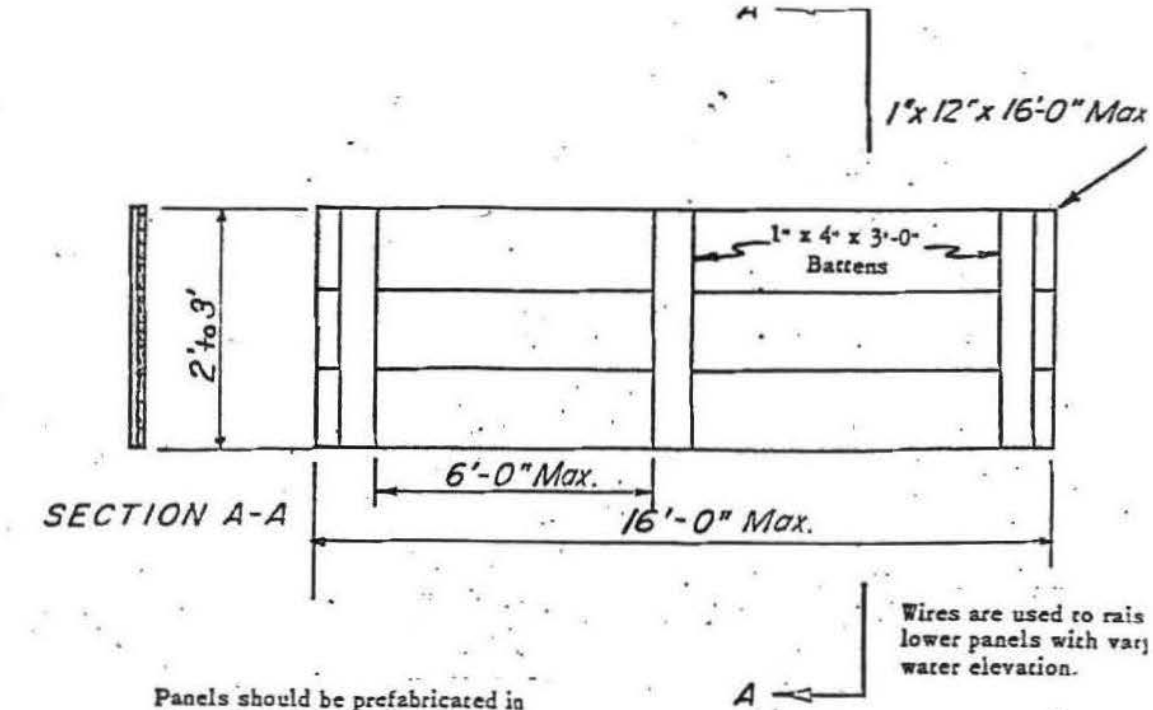
Do not sack boils not carrying
material but maintain surveilance
during flood periods.

INTERNATIONAL BOUNDARY & WATER COMMISSI
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING
CONTROL OF SAND BOILS
(Away from levee)



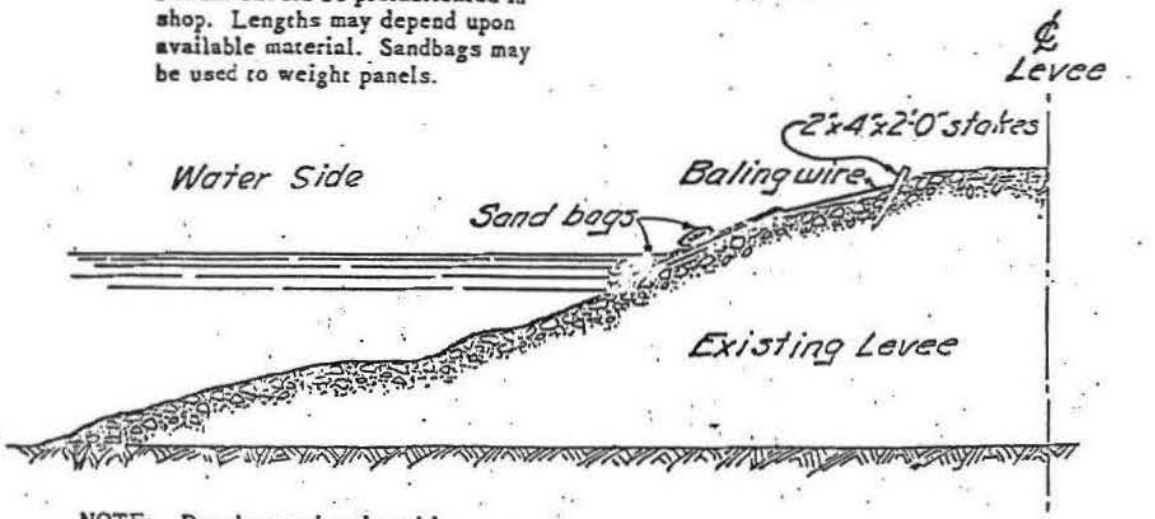
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

CONTROL OF SAND BOILS
(Near levee)



Wires are used to rais
lower panels with var
water elevation.

Panels should be prefabricated in shop. Lengths may depend upon available material. Sandbags may be used to weight panels.



NOTE: Panels may be placed in a vertical position depending upon existing conditions.

INTERNATIONAL BOUNDARY & WATER COMMISSI
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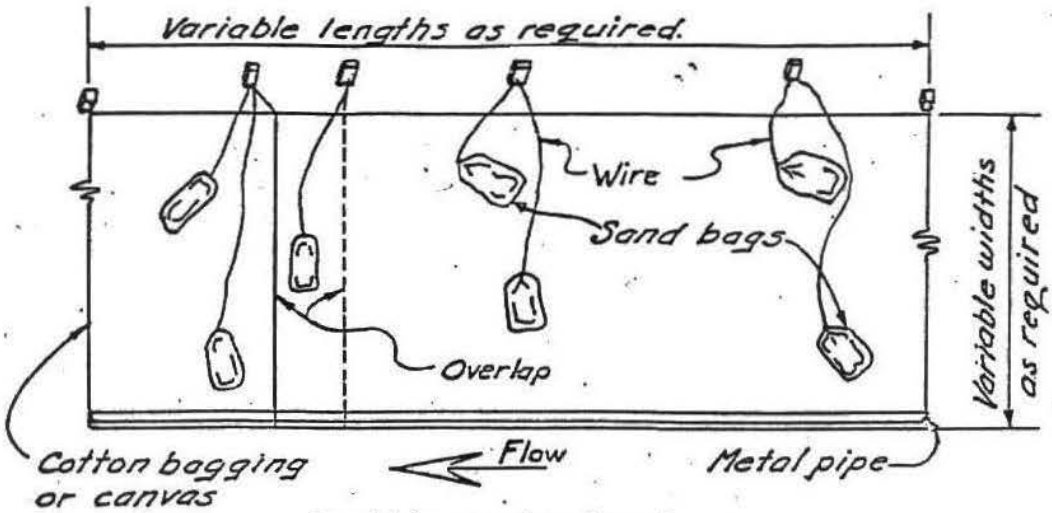
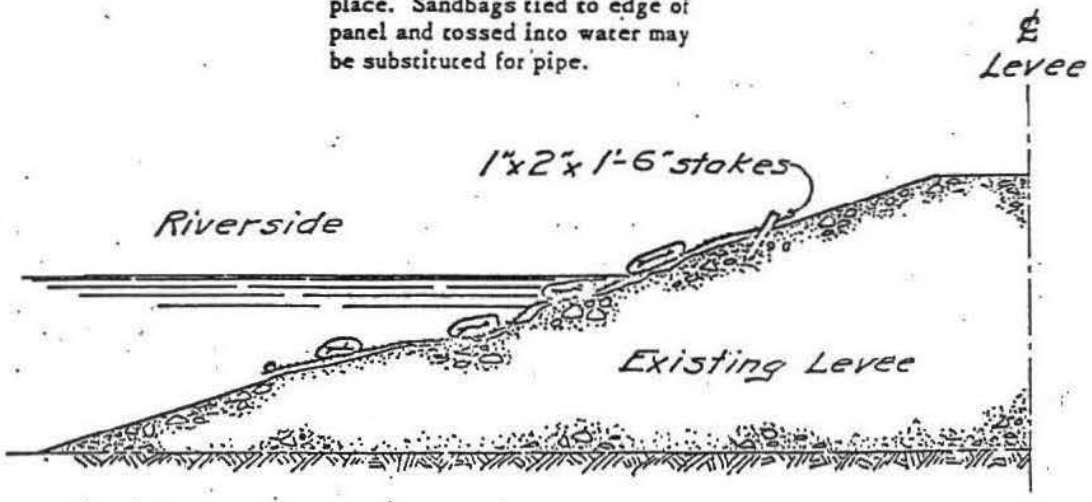
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

WAVE WASH PROTECTION



Material is wrapped on pipe and rolled into water. Bags placed at random keep cloth panels in place. Sandbags tied to edge of panel and tossed into water may be substituted for pipe.

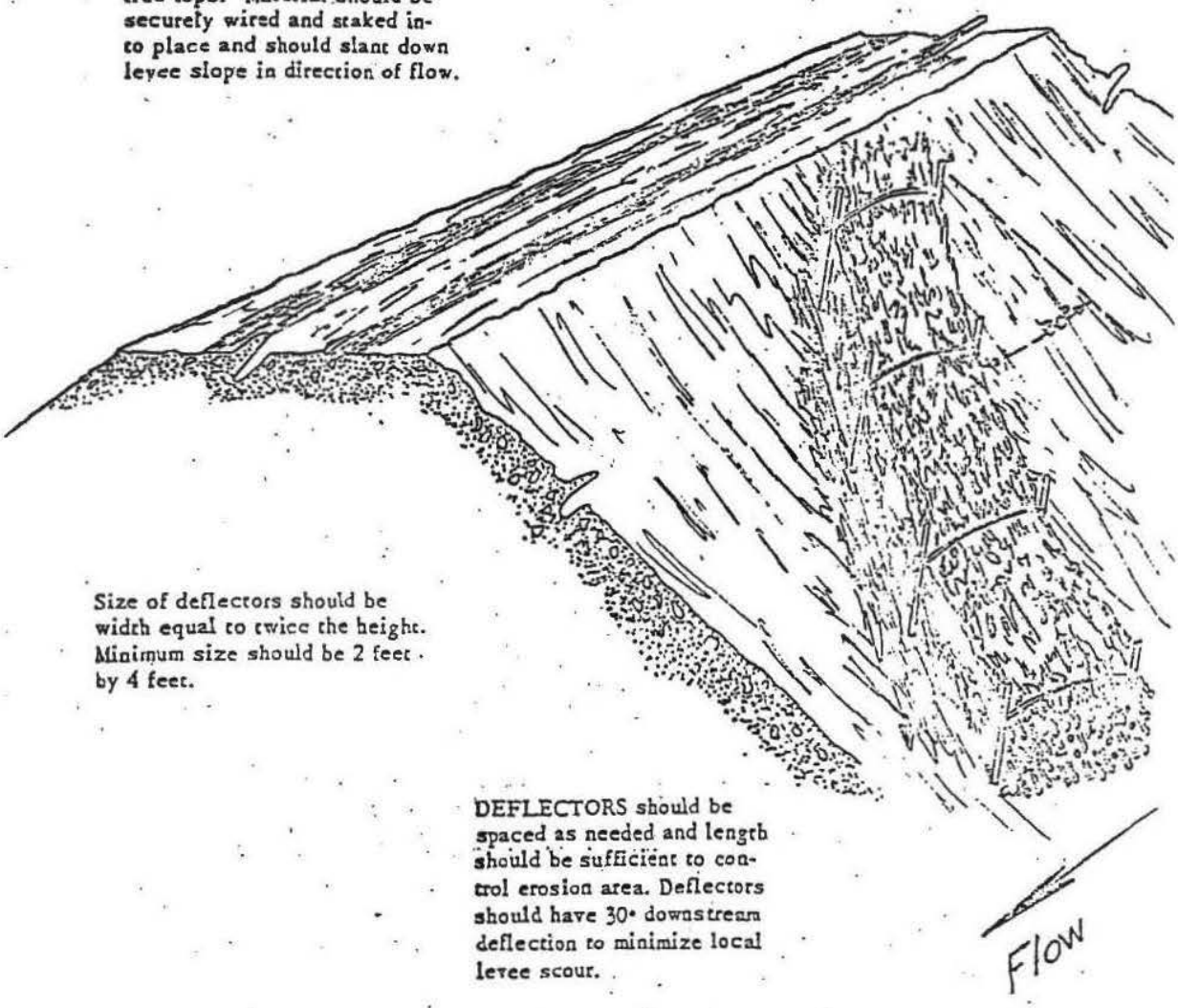


Always lay cloth panels in an upstream direction. Tie all bags to levee with wire and stakes.

INTERNATIONAL BOUNDARY & WATER COMMISSI
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

WAVE WASH PROTECTION

DEFLECTORS may consist of brush, stone-filled bags or tree tops. Material should be securely wired and staked into place and should slant down levee slope in direction of flow.

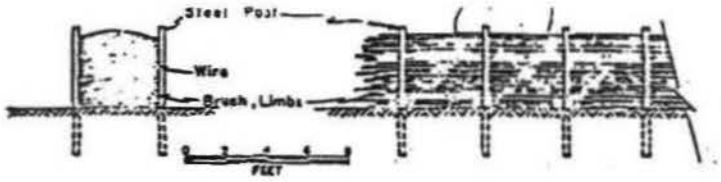


Size of deflectors should be width equal to twice the height. Minimum size should be 2 feet by 4 feet.

DEFLECTORS should be spaced as needed and length should be sufficient to control erosion area. Deflectors should have 30° downstream deflection to minimize local levee scour.

INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

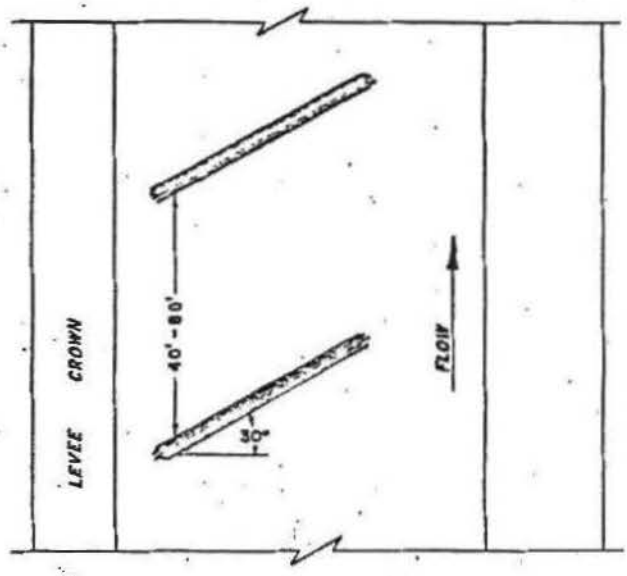
CONTROL OF CURRENT SCOURING

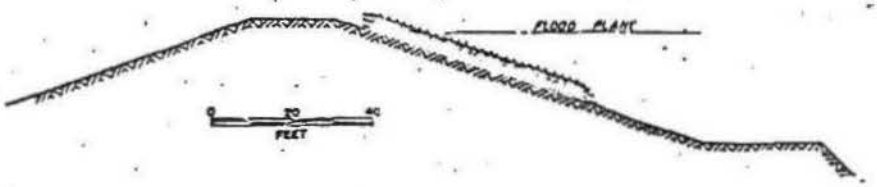


Bale brush for ease in handling
Sawbuck may be used as improvised bailing frame

Use wire for guying posts and tying down brush bales
Weight structure with rock, cobbles if available

Bankhead (upper end) must be securely anchored well above water line





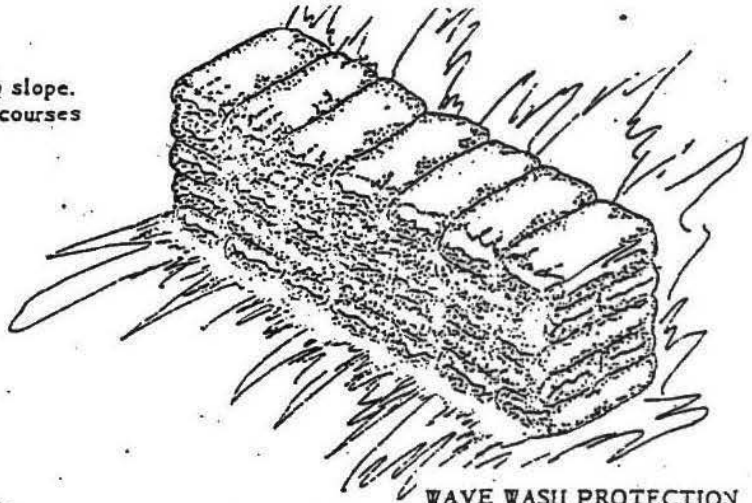
INTERNATIONAL BOUNDARY & WATER COMMISSI
UNITED STATES & MEXICO
UNITED STATES SECTION

METHODS OF FLOOD FIGHTING

CURRENT DEFLECTOR AND VELOCI
RETARD FOR PREVENTION OF
SLOPE EROSION

REVETMENTS

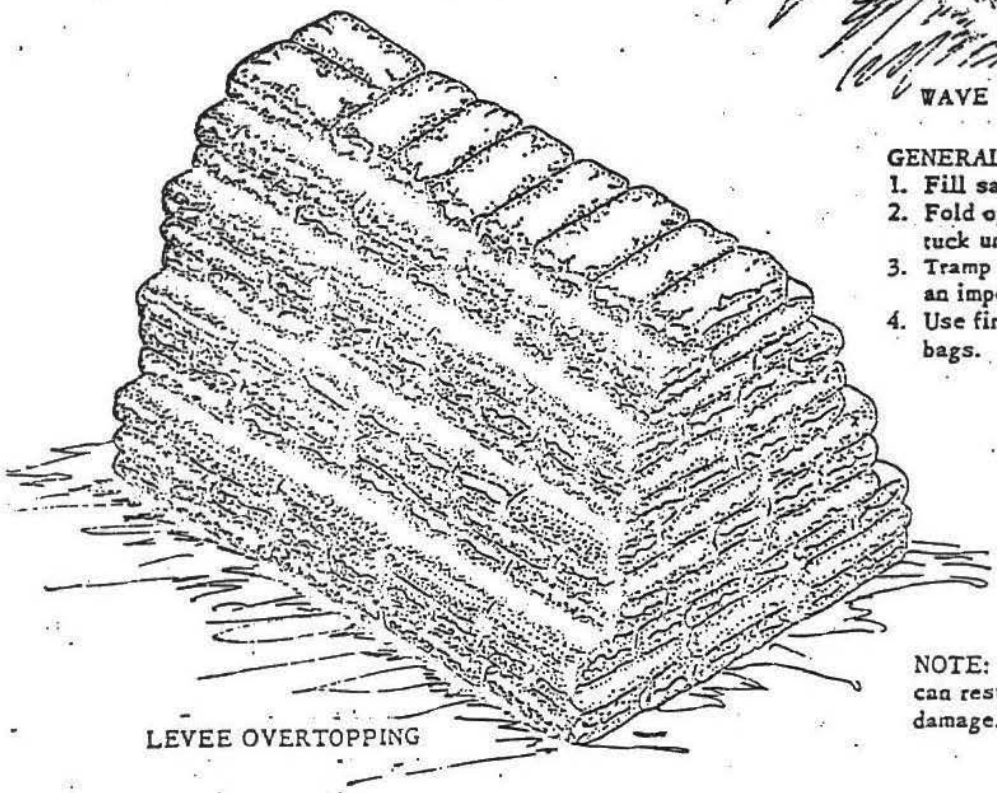
Place bags perpendicular to slope.
Place header and stretcher courses as shown.



WAVE WASH PROTECTION

GENERAL:

1. Fill sandbags ½ to 2/3 full.
2. Fold open end of bag over & tuck underneath.
3. Tramp bags with feet to obta an impervious section.
4. Use fine sand or silt for fillir bags.



LEVEE OVERTOPPING

NOTE: Improperly placed ba can result in failure & serious damage.

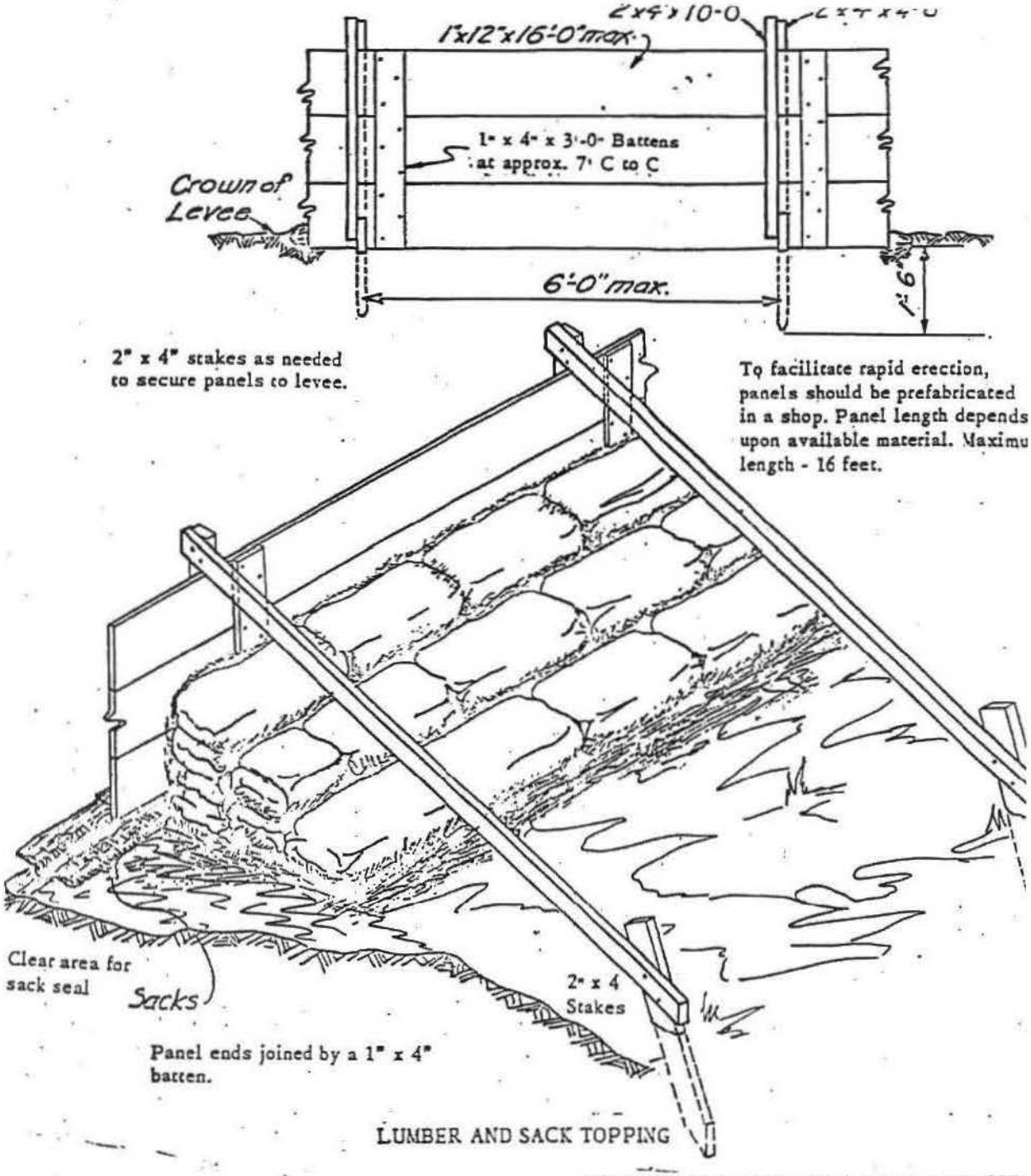
LEVEE SECTION

For heights 1 foot or less lay 3 single staggered courses in a lengthwise direction. For heights in excess of 1 foot lay bags in manner shown above with height proportional to base.

INTERNATIONAL BOUNDARY & WATER COMMISSIO
UNITED STATES & MEXICO
UNITED STATES SECTION

METHODS OF FLOOD FIGHTING

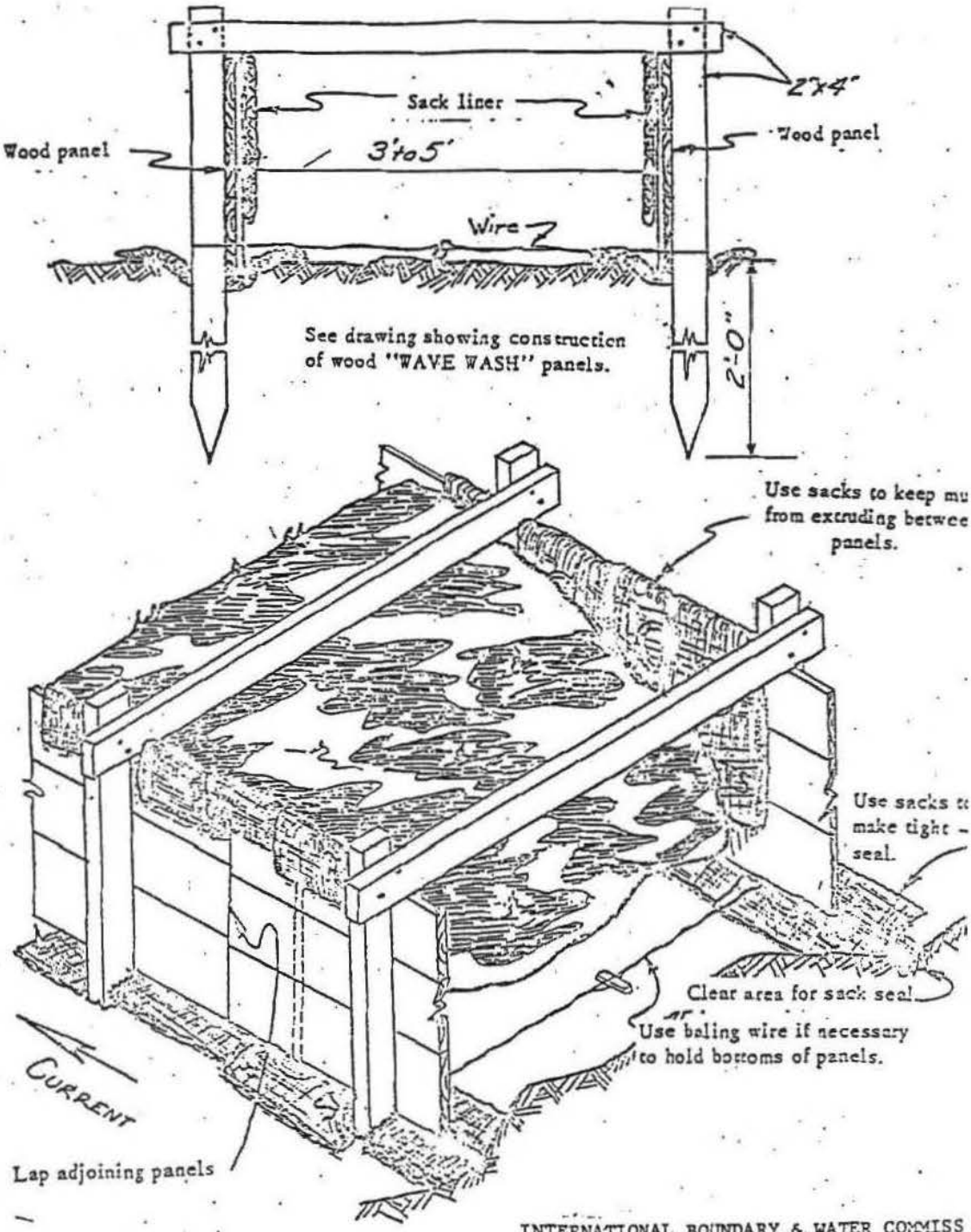
ADDITIONAL USES OF SANDBAGS



LUMBER AND SACK TOPPING

INTERNATIONAL BOUNDARY & WATER COMMISSI(
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

CONTROL OF LEVEE OVERTOPPING



MUD BOX

INTERNATIONAL BOUNDARY & WATER COMMISS
UNITED STATES & MEXICO
UNITED STATES SECTION
METHODS OF FLOOD FIGHTING

CONTROL OF LEVEE OVERTOPPING

EXHIBIT 12
FLOOD PATROL SECTORS

GENERAL INSTRUCTIONS FOR PATROLMEN.
FLOOD PATROL AND FLOOD FIGHTING

1. Each person involved must realize the extreme importance and responsibilities of his part and position in the flood fighting organization.

2. Each man on patrol, as well as others, should be alerted and instructed to observe, record, and report:
    a. Progressive flood stages.
    b. Boils and seeps on the landside of levees and dikes.
    c. Slope and crown erosion from waves and currents.
    d. Structures' condition and proper operation of same.
    e. Pumping across levee into floodway- watch for levee erosion and pipes that should be covered to permit traffic over them.
    f. Watch levee freeboard-report any condition that isles than four (4') feet measured vertically.
    g. Watch for possible positive or negative flow through structures. 1. Open if positive. 2. Close if negative. Patrol Crews will continue to monitor structures and if there is evidence that a structure is leaking, the crews will check for positive or negative flow. Positive flow referring to water flowing into the floodway system and negative flow referring the water flowing out of the floodway system. Crews will check for positive/negative flow by attaching a small weight to a string and lowering it into the structure. The stream current will pull the weight into or away from the floodway. If the weight is pulled away from the floodway, there is negative flow which means water is escaping from the floodway onto the landside. If the weight is pulled into the floodway, there is positive flow and water is flowing into the floodway. This method will be used during the flood and after the flood waters begin to recede. Determinations need to be made on whether a structure is to be opened or closed.
    h. Caution-do not block any railroads until Mercedes Office has notified the railroad officials.

3. Observe at all times the safety rules and safety program.

4. Assure that equipment is at all times serviced, fueled, and ready to go at a moment's notice. It will be management's responsibility to see that equipment is strategically place.

5. Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sighting or condition, however seemingly unimportant.

6. Each patrolman should not leave his post or assigned patrol sector until relieved, unless instructed otherwise.

    a. Each patrol unit will be furnished a log book. All gage readings, problems, emergency situations, etc. should be recorded, together with time and date. Each patrolman should sign the log book at the end of his shift.
    b. Upon being relieved, he will pass on to his relief: the log book, the present situation prevailing in his particular sector, any particular work instructions that are to be carried out during the past shift.
    c. Each patrolman shall be expected and prepared to be "double shift" if an emergency should require same.

7. Patrol area and special instructions regarding Patrol Sectors are listed below.

Patrol Sector #1

River Levee downstream of Penitas; North Levees, Banker and Main Floodways from Banker Weir to end of North Levee downstream of US 281.

Stop logs for railroad at Penitas are stored in the rear of Mercedes Yard.

Stop logs for United Irrigation canal that crosses the levee upstream of Bentsen Park are stored in the rear of Mercedes Yard.

Banker Weir – Observe and report any visible problems.

Check six-barrel structure upstream of US 281.

Patrol Sector #2

South Levee, Banker and Main Floodway from Banker Weir to Donna Rd. and River levee from Banker to Floodway Retamal Dam.

Hidalgo Loop Levee – Check for erosion at Hidalgo Bridge and Pharr San Juan new pumping plant.

Donna Pump –Watch fro river bank erosion or other problems with concrete retaining wall.

Patrol Sector #3

River levee downstream of Retamal Dam.

If levee is impassable spot check for accessibility.

No night patrol.

Check for any sudden rises at the San Benito Gaging Station.

Patrol Sector #4

Check for any erosion where La Feria and Harlingen Canal Siphons cross the Arroyo Floodway

MPRR crossing at Mercedes may need fill on both east and west levees material is stocked on the landside of the levees.

Patrol Sector #5

Campacuas Siphon – Watch for any type of erosion.

Check Stop-Log Structure in place across FM 491 at District #9's canal.
(When TxDot rebuilds bridge in 2005 stop-log will no longer be required)

Willacy Canal Siphon – Check for erosion.

Patrol Sector #6

North Levee of Arroyo Colorado, Divisor Dike and South and East Levees of the North Floodway from Arroyo Colorado to Highway 77.

Watch for erosion at the La Feria Canal Siphon on Arroyo

Check Arroyo North Levee only once each shift.

Divisor Dike – Watch for erosion at upstream end, Structure No. 163-B and where old restriction structure was located.

Mercedes – Old Highway 83 and MPRR bridges may need fill or sandbags across them.

Campacuas Siphon – Watch for erosion.

Stop log structures must be installed at East Levee and Highway 491 for large floods. They are stored in Mercedes Warehouse.

Patrol Sector #7

North Levee, North Floodway from Highway 77 to end.

Watch for and report any flow coming around the end of the levee and flowing upstream on landside of levee.

Be especially watchful for seepage in this sector.

Patrol Sector #8

South Levee of North Floodway from Highway 77 to end.

Watch for and report any flow coming around the levee and flowing upstream on landside of levee.

Be especially watchful for seepage in this sector.

Anzalduas- Retamal Sector

Anzalduas Dam personnel will patrol Anzalduas Dike. They will also observe and report any visible problem on Banker Weir, the South Levee of Banker Floodway downstream to 23rd Street, and Retamal Dike. This is in addition to regular patrols and will done when traveling from dam to the other.

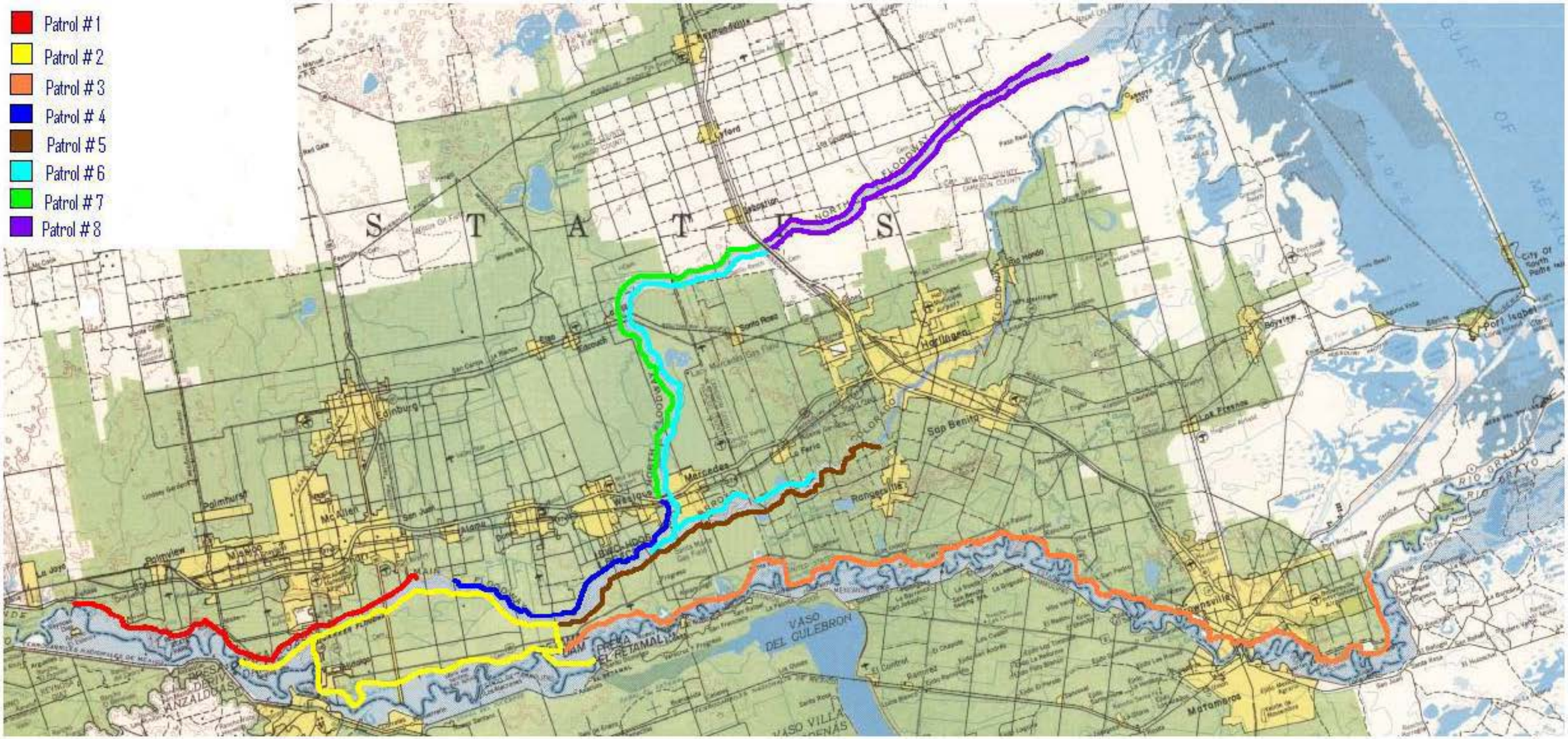

Patrol # 1
Patrol # 2
Patrol # 3
Patrol # 4
Patrol # 5
Patrol # 6
Patrol # 7
Patrol # 8
S T A T E S
Edinburg
McAllen
Mercedes
Weslaco
Harlingen
Rio Hondo
Raymondville
Los Fresnos
Brownsville
Port Isabel
Boyrise
Matamoros
VASO DEL GULEBRON
GULF OF MEXICO

EXHIBIT 13
TRAVEL TIME OF FLOOD FLOWS

5 U.S.C. 552(B)(7)(E) AND (F)

5 U.S.C. 552(B)(7)(E) AND (F)

EXHIBIT 14
LEVEE ELEVATIONS AT SELECTED LOCATIONS

Peak Discharges at Various Stages for Flows at Hidalgo > 20,000 cfs

Rio Grande City

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June	31	142.60	77,300
	June-July	27	138.33	43,000
	October	10	141.87	68,900
1947	June	26	137.28	35,800
	August	4	137.47	34,100
1948	June-July	28	153.74	145,000
	July	8	147.53	78,700
	September	12	153.50	141,000
1949	Feb-March	28	141.40	60,200
	April	26	146.71	79,500
	May	12	135.24	24,700
	June	10	136.70	35,000
	August	11	138.15	43,600
1950	May	28	137.16	38,000
1951	May	18	137.93	40,000
	June	13	138.88	38,000
	September	16	146.78	65,600
1953	August	28	145.34	46,400
	September	5	142.59	41,100
1958	October	17	157.40	104,00
1967	September	22	161.40	220,000
1971	September	19	154.01	74,200
	October	12	152.13	60,700
1973	June-July	28	148.00	46,000

1976	August	26	147.18	39,300
	Sept-Oct	16	147.71	40,000

Mission Bridge

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June-July	1	93.20	3,300
	July	10	83.97	200
	September	14	94.74	6,040
1949	Feb-March			
	April	28	92.16	1,400
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October	19	100.46	32,000
1967	September	26	104.96	83,300
1971	September	23	95.45	11,000
	October	15	95.38	10,800
1973	June-July	30	93.16	2,270

Banker Floodway

1976	August	27	109.08	11,500
1978	Sept-Oct	16	109.76	11,500

Hackney Bridge

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June-July	1	98.10	5,000
	July	10	95.81	1,200
	September	14	101.57	11,700
1949	Feb-March			
	April	28	98.91	5,410
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October	19	102.78	22,600
1967	September	26	106.22	43,300
1971	September			
	October			
1973	June-July			
1976	August	27	109.08	11,500

1978	Sept-Oct	16	109.76	11,500

N. Floodway @ Mercedes

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June-July			
	July			
	September			
1949	Feb-March			
	April			
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October	20	69.30	37,200
1967	September	26	72.45	61,200
1971	September	24	62.80	7,720
	October	16	62.86	7,970
1973	June-July	2	58.35	1,120
1976	August	29	63.08	8,250

1978	Sept-Oct	1	63.45	7,860

N. Floodway @ Sebastian

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June- July	3	35.74	1,180
	July			
	September	16	40.88	10,100
1949	Feb-March	30	38.37	3,040
	April			
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October	20	45.07	39,300
1967	September	26	46.67	59,200
1971	September	25	41.65	7,900
1973	June-July	7	33.27	898
1976	August	30	41.63	10,000
1978	Sept-Oct	3	41.72	8,480

Arroyo Colorado @ Mercedes

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June-July			
	July			
	September			
1949	Feb-March			
	April			
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October			
1967	September	26	67.91	60,100
1971	September	24	54.55	1,670
	October	16	54.69	1,830
1973	June-July	2	54.70	1,860
1976	August	29	54.86	2,146
1978	Sept-Oct	2	54.84	2,060

Arroyo Colorado @ Harlingen

Yr	Month	Date	El., msl	Flow, cfs
1946	May-June			
	June-July			
	October			
1947	June			
	August			
1948	June-July			
	July			
	September			
1949	Feb-March			
	April			
	May			
	June			
	August			
1950	May			
1951	May			
	June			
	September			
1953	August			
	September			
1958	October	21	33.68	19,700
1967	September	27	43.85	55,400
1971	September	25	12.67	2,390
	October	16	11.34	1,820
1973	June-July	3	11.25	1,930
1976	August	31	12.41	1,880
1978	Sept-Oct			

Rio Grande Flood Peaks Maximum Gage Heights
And Max Momentary Discharges

Station	**1958**			**1967**		
	Date	Gage, msl	Flow, cfs	Date	Gage, msl	Flow, cfs
Below Falcon	11/9		48,900			
Rio Grande City	10/17	57.40	104,000	9/22	61.40	220,000
(Fort Ringold)						
Los Ebanos	10/19	124.60		9/25	128.35	
(Penitas)						
Above Mission Inlet				9/26	124.70	216,000
(7&14)						
Anzalduas Pool (CILA)	10/19	114.50		9/24	119.00	
Below Anzalduas	10/19	111.48	63,920	9/24	113.20	131,000
Retamal Dam (TW)						
Progreso	10/22	76.25	19,900	9/26	77.40	60,700
San Benito	10/22	60.07	13,600	9/29	61.05	25,000
Brownsville	10/23	31.84	9,760	9/30	31.08	15,900
Banker Intel						
Mission Floodway (10th St)	10/19	100.46	32,000	9/26	104.96	83,300
Hackney Floodway	10/20	102.78	22,600	9/26	106.22	43,300
Main Floodway (Weslaco)						
N. Floodway (Mercedes)	10/20	69.30	37,200	9/26	72.45	61,200
Arroyo Colorado (Fuste)				9/26	15.94	60,100

N, Floodway (Sebastian)	10/20	45.07	39,300	9/26	46.67	59,200
Arroyo Colorado (S. Mercedes)						
Arroyo Colorado (Hgn)	10/21	33.08	19,700	9/26	43.85	55,400
Retamal Inlet						

Station	**Sept 1971**			**Oct 1971**		
	Date	Gage,msl	Flow, cfs	Date	Gage,msl	Flow, cfs
Below Falcon	9/17		81,200	10/9		42,400
Rio Grande City	9/20	54.01	74,200	10/12	52.08	60,400
(Fort Ringold)						
Los Ebanos	9/22	121.40		10/14	121.10	
(Penitas)						
Above Mission Inlet	9/22	118.63	67,800	10/14	118.55	66,600
(7&14)						
Anzalduas Pool (CILA)	9/23	114.37		10/15	114.53	
Below Anzalduas	9/23	107.97	41,300	10/15	108.27	41,700
Retamal Dam (TW)						
Progreso	9/24	75.79	27,500	10/17	76.35	35,200
San Benito	9/26	58.66	16,400	10/17	58.82	1,730
Brownsville	9/29	29.92	15,100	10/19	30.77	16,300
Banker Intel						
Mission Floodway (10th St)	9/23	95.43	11,000	10/15	95.37	10,400
Hackney Floodway						
Main Floodway (Weslaco)	9/24	62.23	9,490	10/16	64.33	10,100
N. Floodway (Mercedes)	9/24	62.80	7,720	10/16	62.84	7,940
Arroyo Colorado (Fuste)	9/23	2.25	1,670	10/16	2.72	1,830

N, Floodway (Sebastian)	9/25	41.66	8,070	10/16	41.28	8,630
Arroyo Colorado (S. Mercedes)						
Arroyo Colorado (Hgn)	9/25	12.67	2,390	10/16	11.34	1,820
Retamal Inlet						

Station	**June-July 1973**			**1976**		
	Date	Gage,msl	Flow, cfs	Date	Gage,msl	Flow, cfs
Below Falcon				8/22		40,000
Rio Grande City	6/28	48.00	46,000	8/26	47.18	39,300
(Fort Ringold)						
Los Ebanos	6/29	118.50		8/27	128.22	39,800
(Penitas)						
Above Mission Inlet	6/30	116.02	29,000	8/27	104.79	28,600
(7&14)						
Anzalduas Pool (CILA)	6/29	112.34		8/28	109.05	
Below Anzalduas	6/30	102.69	29,000	8/27	104.79	28,600
Retamal Dam (TW)				8/19	77.30	
Progreso	6/30	75.5	20,100	8/19	73.46	16,100
San Benito	7/4	59.59	17,100	8/19	57.46	13,900
Brownsville	7/7	31.43	15,600	8/31	28.88	14,000
Banker Intel				8/27	109.08	11,500
Mission Floodway (10^{th} St)	6/30	93.16	2,270			
Hackney Floodway						
Main Floodway (Weslaco)	7/2	62.12	2,960	8/25	65.82	12,100
N. Floodway (Mercedes)	7/2	58.35	1,120	8/25	63.08	8,410
Arroyo Colorado (Fuste)	7/2	2.73	1,860			

N, Floodway (Sebastian)	7/4	33.27	898	8/25	41.63	10,100
Arroyo Colorado (S. Mercedes)				8/29	2.98	2,160
Arroyo Colorado (Hgn)	7/8	11.25	1,930	8/25	1314	2,070
Retamal Inlet				8/30		11,300

Station	**1983**					
	Date	Gage,msl	Flow, cfs	Date	Gage,msl	Flow, cfs
Below Falcon	5/1		13,400			
Rio Grande City (Fort Ringold)	9/29	47.71	40,000			
Los Ebanos (Penitas)	9/30	27.86	37,800			
Above Mission Inlet (7&14)						
Anzalduas Pool (CILA)	10/1	109.25				
Below Anzalduas Retamal Dam (TW)	9/27	99.21	24,700			
Progreso	9/27	77.10				
San Benito	10/7	56.55	13,700			
Brownsville	10/12	28.06	13,100			
Banker Intel	10/1	109.76	11,500			
Mission Floodway (10^{th} St)						
Hackney Floodway						
Main Floodway (Weslaco)	10/2	65.73	11,000			
N. Floodway (Mercedes)	10/2	63.29	7,860			
Arroyo Colorado (Fuste)						
N, Floodway (Sebastian)	10/3	41.35	8,480			
Arroyo Colorado (S. Mercedes)	10/2	2.96	2,060			
Arroyo Colorado (Hgn)	10/7	14.20	2,990			
Retamal Inlet	10/1		8,300			

LOWER RIO GRANDE FLOOD CONTROL PROJECT
INTERIOR FLOODWAY
DESIGN FLOOD WATER SURFACE AND LEVEE ELEVATIONS AT HIGHWAY CROSSING

	Design Flood W.S. Elev. Ft.	Top of Roadway Surface at Hwy. Crossing Elev. - Feet		Top of Levee D/S & U/S of Hwy. Crossing Elev. - Feet	
Banker Floodway	**(105,000 cfs)**	**N. Side**	**S. Side**	**N. Levee**	**S. Levee**
State 115	109.8	111.4	110.7	111.8	111.3
State 336	107.9	109.9	109.8	109.7	109.7
FM 2061 (Jackson Rd.)	104.1	103.9	103.7	105.6	106.0
Main Floodway	**(105,00cfs)**	**N. Side**	**S. Side**	**N. Levee**	**S. Levee**
U.S. 281	100.2	101.1	102.1	104.3	104.7
Fm 2557	97.4	96.2	98.2	62.4	102.0
FM 907	96.0	100.6	95.9	101.6	100.5
FM 493 (Donna Rd.)	86.9	89.2	88.4	90.3	91.0
FM 88	79.7	81.1	81.3	81.0	80.9
FM 1015 (Progreso Rd.)	77.2	78.9	78.8	79.0	79.7
North Floodway	**(84,000 cfs)**	**W. Side**	**E. Side**	**W. Levee**	**E. Levee**
Old 83	75.1	72.7	73.0	76.6	79.2
U.S. 83 (Exwy 83)	74.5	76.5	79.0	76.5	79.1
FM 491 (Baseline Rd.)	72.4	70.5	68.2	75.8	74.9
State 107	64.0	63.9	63.8	67.2	67.3

		N. Side	S. Side	N. Levee	S. Levee
FM1 1425	58.8	59.8	60.8	61.2	61.1
FM 506	54.4	54.3	53.8	56.6	56.9
U.S. 77	49.5	51.4	50.7	51.6	50.8
FM 507	36.4	36.0	35.5	38.7	38.8
FM 1420 (Santa Monica)	24.8	25.8	25.8	29.4	29.3

FROM RETAMAL DAM DOWNSTREAM: COMPUTED WATER SURFACE ELEVATIONS FOR THE RIVER CHANNEL WITH A FLOW OF 20,000 C.F.S. (TOP OF RIVER LEVEE ELEVATIONS SHOWN AT SELECTED LOCATIONS)

LOCATION NAME	RIVER MILE	*EL PASO 20,000 CFS DESIGN ELEVATION	ELEVATION TOP OF LEVEE- AS BUILT
Retamal Dam Downstream Side	129.2	82.6 ft.	92.0 Dike @ Dam 88.3- Runn Structure
Progreso Pump	121.6	82.9 ft.	82.9
Progreso Bridge	120.7	77.0 ft.	82.3
Mercedes Pump	115.7	73.8 ft.	78.8
Hidalgo-Cameron County Line	113.0	71.7 ft.	75.5
Santa Maria Pump	111.0	70.1 ft.	74.6
La Feria Pump	109.1	68.9 ft.	73.9
Adams Garden Pump	105.0	66.0 ft.	70.5
San Benito-Harlingen Pump	99.5	63.4 ft.	67.7
San Benito Gaging Station	94.0	61.1 ft.	64.7
Clark Structure (Dist. #16)	82.0	54.0 ft.	57.62
Los Frenos Pump	67.0	44.2 ft	50.0
City of Brownsville Pump	59.0	41.0 ft.	45.0
Gateway Bridge	54.4	38.0 ft.	41.8
El Jardin Pump	48.0	33.9 ft.	36.8- Canal & Levee 30.65 – High Bank & River
River Mile 28 – FM 511 & River Levee	28.0	17.6 ft.	24.8- Design

*Reference: El Paso Headquarters
Backwater Runs,HEC2 program- March 10,19

EXHIBIT 15
RESPONSIBILITIES OF OTHER AGENCIES

Drainage Structures:

The operation of some of the Project's drainage structures during flood emergencies has been assumed by other organizations. The remaining unmarked structures will be operated by the field crews of the United States Section. However, if any organization fails to operate a structure for which they are responsible, the United States Section will operate the structure. These drain structures should be left open as long as local rainwater can drain into the floodway system. If closed, they should be reopened again as soon as drainage into the floodway can be resumed.

Roadways:

The State of Texas Department of Transportation shall plug all "U.S." and "State" highway crossing that are below levee grade, as needed. Warning barricades shall be placed at each crossing when it is closed.

When necessary, County Roads will be closed by the County personnel in which the roads are located.

IBWC will coordinate with Texas Department of Transportation the operation of Automatic Floodgates located on different roadways throughout the floodway system. The current location of these Floodgates are:

1. Bentsen Rd. at River Levee south of Mission, TX.

Railroad Crossing:

IBWC will coordinate the sandbagging of railroad gap closures with the railroad companies. The following locations are of primary concern:

2. Penitas Stoplog Structure (Missouri Pacific Railroad).
3. Railroad crossing the North Floodway at Mercedes (Missouri Pacific Railroad).
4. Railroad Y at the River Levee in Brownsville (Missouri Pacific Railroad).

EXHIBIT 16

5 U.S.C. 552(B)(7)(E) AND (F)

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

FLOOD EMERGENCY OPERATIONS MANUAL

UPPER RIO GRANDE PROJECTS

Edward Drusina, United States Commissioner

Volume III
Chapter M719
Handbook M719

April 2012

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

EXHIBITS

FOREWORD

A. Requirement and Reference

This Flood Emergency Operations Manual has been prepared to define the United States Section's roles and responsibilities in time of flood; to assure that all personnel of the United States Section know their individual duties and responsibilities; and to assure that flood-fighting activities of the United States Section are coordinated with the responsible officers of the Mexican Section, and of other Federal, State and local agencies in the United States.

B. Control

The issuing office for this manual is Operations Department, Operations and Maintenance Division, American Dam/Carlos Marin Field Office. Contact is Division Engineer, Operations and Maintenance Division.

C. Supersession

This manual cancels and supersedes previous manual M719, Volume III dated June 17, 2011. All copies of the previous manual should be disposed of immediately.

D. Effective Date

This manual becomes effective April 23, 2012.

INTRODUCTION

The Upper Rio Grande Projects (URGP) extend along the Rio Grande from Percha Diversion Dam in New Mexico to the Presidio-Hudspeth-Jeff Davis County Line (Tri-County Line) in Texas, which is located approximately 80 miles downstream of the Ft. Quitman Gaging Station. The URGP includes the Canalization Project, Rectification Project, American Dam and American Canal Project, Chamizal Project, and part of the Boundary Preservation Project. From Percha Diversion Dam to the American Diversion Dam in El Paso, Texas, a distance of about 105 miles (169 kilometers), the Canalization Project provides a means for carrying out the division of waters of the Rio Grande under the provision of the 1906 Water Treaty with Mexico and provides flood control protection for floods up to the 100-year flood from flood runoff below Caballo Dam and releases from Caballo Dam. The project is the responsibility of the United States Section of the International Boundary and Water Commission, United States and Mexico.

From the American Diversion Dam (American Dam) downstream to Little Box Canyon, a distance of about 91 miles (146 kilometers), the Rectification Project stabilizes the boundary between the United States and Mexico and provides flood control protection to the lands in each country. The Rectification Project was constructed and is operated and maintained jointly with Mexico pursuant to the Convention of February 1, 1933 (48 Stat. 1621).

The American Dam Project, extending from American Dam to International Dam, was constructed and is operated and maintained pursuant to the Act of August 29, 1935 (49 Stat. 961). It provides a means of effecting physical control of the division of the waters allocated to the United States and Mexico under the 1906 Convention. The International Dam is operated and maintained by the U.S. Section and utilized to divert Mexico's allotment of water to the Acequia Madre (irrigation canal).

The Chamizal Project, consisting of a concrete-lined channel, was constructed and is operated and maintained jointly with Mexico pursuant to authority under the American-Mexican Chamizal Convention Act of April 29, 1964 (78 Stat. 184). The Chamizal Project established and stabilized the international boundary between the two countries and provided flood protection to property in both countries.

The Boundary Preservation Project, from Quitman Canyon to just upstream of Presidio, Texas is the result of an agreement of February 16, 1970 between the Governments of the United States and Mexico to restore and preserve the Rio Grande to its character as the international boundary and to improve the management of those arid and semi-arid lands which had been abused by unsound farm and range practices and short-term droughts. The Project involves the development and implementation of a plan for arresting and reversing desertification, using the sound management practices to provide channel and vegetation restoration. The Boundary Preservation Project is not a flood control project.

The United States Section of the Commission, by Federal law, is responsible for the construction, operation and maintenance of authorized projects providing flood control protection along the Rio Grande. Due to the international nature of floods on the Rio Grande, the United States Section of the Commission is responsible for coordinating, reporting, and exchanging data with the Mexican Section of the Commission and for patrolling the Rio Grande river levees in the United States. The United States Section of the Commission informs other United States federal, state and local authorities of existing or expected flood conditions along the Rio Grande between Percha Diversion Dam and Presidio, Texas.

PURPOSE

This Flood Emergency Operations Manual has been prepared to define the International Boundary and Water Commission, United States Section's (USIBWC) functions and responsibilities in time of flood; to assure that United States Section personnel having responsibilities during a flood between Percha Diversion Dam and the end of the Rectification Project know their duties; and to insure that flood-fighting activities of the United States Section are coordinated with the Mexican Section and carried out efficiently, while providing adequate coordination with other Federal, State and local agencies in the United States.

OBJECTIVE

The objective of this manual is to provide a basis for a sound organizational plan with an action program to save lives and properties from Rio Grande floods. For this purpose, this manual defines:

1. Mission
2. Responsible Officer
3. Operations Center
4. Organization
5. Preparatory Requirements Before Flood Season
6. Alert Actions
7. Requirements and Actions During Flood
8. Photographic Coverage
9. Requirements and Actions After Flood

MISSION

The flood mission of the USIBWC is to provide adequate flood protection to United States property landward of USIBWC river levees by performing annual maintenance and flood monitoring in a manner authorized by the US Congress achieved through the following:

1) Ensure the collection of hydraulic and hydrologic information, dissemination of that information, and projection or forecasting of flood conditions.

2) Ensure that necessary field operations are conducted to assure the security of United States Section project flood levees and proper operation of structures in the floodplain.

3) Ensure that flood operations in the international reach of the Rio Grande are properly coordinated with the Mexican Section of the Commission.

4) Ensure that the Public Affairs Office provides pertinent information through public releases. Flood data will be exchanged with other federal, state and local agencies with notification through the Public Affairs Office.

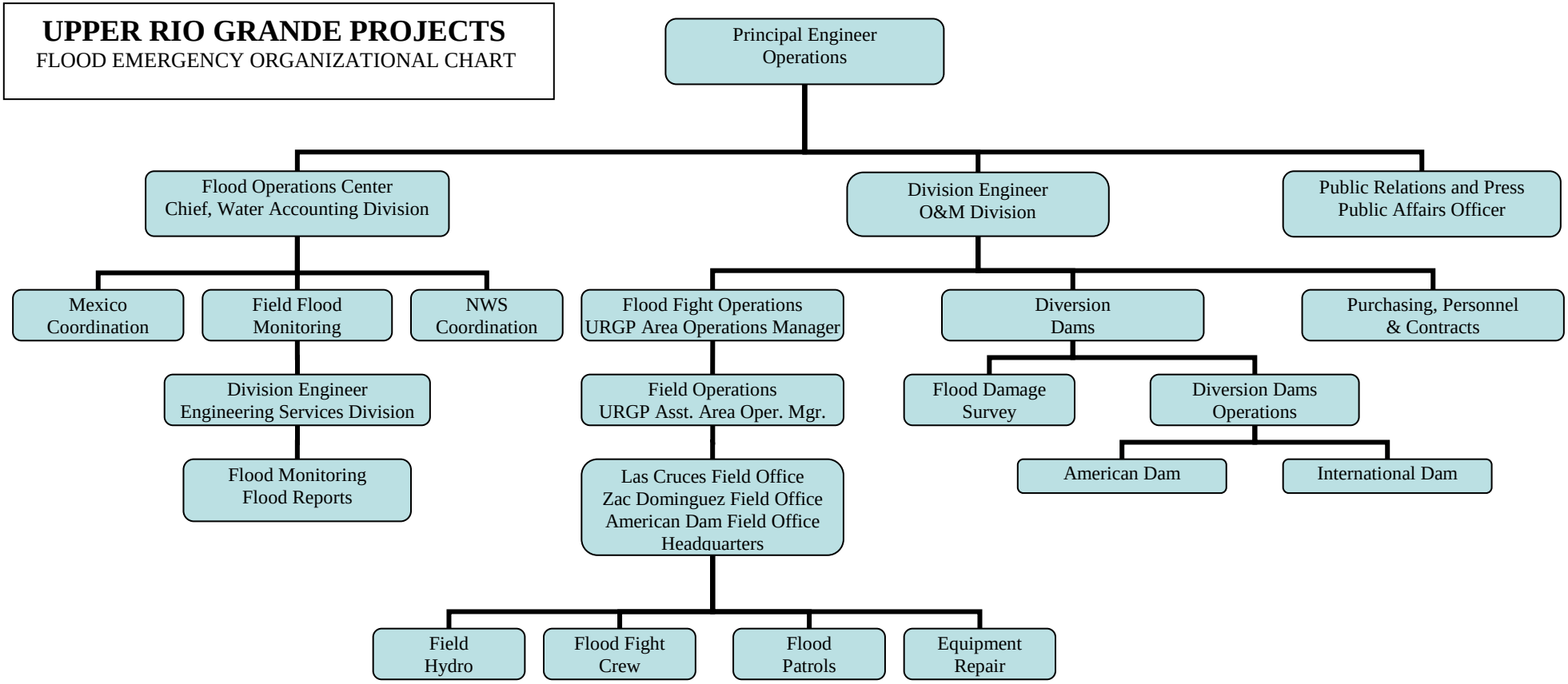
RESPONSIBLE OFFICER

The person directly responsible for carrying out the mission of the United States Section is the *Principal Engineer, Operations Department,* or his assigned deputy, *Division Engineer, Operations and Maintenance Division*. They will ensure complete coordination and keep the United States Commissioner fully informed.

ORGANIZATION

The organization responsible for coordinating and executing flood fight activity within the URGP shall consist of the URGP personnel, designated personnel from the U.S. Section Headquarters in El Paso, and such outside forces, equipment and labor as the circumstances warrant. The Flood Emergency Organizational Chart is shown on the following page.

UPPER RIO GRANDE PROJECTS
FLOOD EMERGENCY ORGANIZATIONAL CHART



PART A
HYDROGRAPHIC FLOOD OPERATIONS

1. MISSION: To minimize the loss of lives and property by:

a. Securing and analyzing weather and stream flow data necessary for flood forecasts and operations;
b. Providing advance information on the projected flood conditions; and
c. Documenting the flood conditions for future flood control planning and flood regulation.

2. RESPONSIBLE OFFICER:

The *Chief, Water Accounting Division,* is the responsible officer and reports to the *Principal Engineer, Operations Department.* The *Principal Engineer, Operations Department,* or the assigned deputy, *Division Engineer, Operations and Maintenances Division,* is responsible for flood monitoring and the development of all flood reports. The *Chief, Water Accounting Division,* with assistance from the *Division Engineer, Operations and Maintenance Division,* will ensure that:

1) Flood data is acquired, such as: rainfall amounts, current meter measurements, streamflows, weather forecasts from the US National Weather Service, and pertinent flood data from the U.S. International Boundary and Water Commission, Mexican Section (MXIBWC), which may be tabulated and plotted graphically for enhancement of analysis.

2) There is coordination of flood data exchange with the MXIBWC. The USIBWC provides the NWS with all flood data collected including spills or releases of water from Caballo Dam.

3) All flood data and NWS forecasts are analyzed to project flood conditions such as time of the expected peak(s), and peak flows at principal gaging stations.

4) All flood data is documented in logical sequence in bound folders and the *Principal Engineer, Operations Department,* is provided a daily report during flood operations, including up-to-date information on the effects of a flood and potential impacts as the flood continues.

3. FLOOD OPERATIONS CENTER:

During the occurrence of a flood on the Rio Grande between Percha Diversion Dam and the end of the Rectification Project, the United States Section Flood Operations Center will be established within the Emergency Operations Center in the USIBWC Headquarters Building at El Paso, Texas. The Water Accounting Division will coordinate with NWS regarding flood forecasting. The Staff Hydrologists or the assigned deputy will be responsible for acquiring all data from US field personnel and federal, state and local agencies. This data will be placed on tabular forms and be used in flood forecasting performed by the staff of the Water Accounting Division. The new rating curves for gaging stations between Percha Dam and Fort Quitman shall be provided from the Water Accounting Division prior to each flood season. Water Accounting personnel will be responsible for plotting discharge hydrographs and for interpreting flood operations criteria. All flood data will be properly documented and daily reports will be submitted

to the *Principal Engineer, Operations,* thru the *Division Engineer, Operations and Maintenance*.

The *Area Operations Manager (AOM), URGP*, or the assigned deputy, will coordinate with the Water Accounting Division to send the appropriate Field Data Collection Teams to collect high water marks as the flood peak moves downstream. Requests will be made to the Field Hydrographers for flow measurements to be made during the rising limb, peak and recession of the flood at the stream gages in the flood reach. The *AOM, URGP,* will arrange for immediate coordination and activation of project personnel and equipment.

4. ORGANIZATION:

a. Field Hydrographic Teams: Hydrographic measuring teams will be organized from URGP personnel and other United States Section personnel, as circumstances warrant. A roster of U.S. Section hydrographic personnel is listed in **Exhibit 2**. These teams will be directed by the *AOM, URGP*.
b. Field Data Collection Teams - Field data collection teams will be organized from URGP personnel and other United States Section personnel, as circumstances warrant. A roster of field data collection personnel is listed in **Exhibit 1**. **Exhibit 3** lists the equipment required by each team.
c. Communications: Transmission of data will be by the fastest and most reliable method. All available mobile radio units or cellular telephones shall be used to cover the maximum flood area. Reporting of river stages shall be performed on hourly intervals unless otherwise directed. See **Exhibit 4** for Project gaging stations (water stage gages / recording stations).

5. PREPARATORY REQUIREMENTS - BEFORE FLOOD SEASON:

Action to be taken **Prior to May 15th of Each Year:**

a. Contact National Weather Service Offices, Forth Worth, Albuquerque, and Santa Teresa, to make arrangements for exchange of data and coordination of forecasts. See **Exhibit 5** for the agency responsibilities per the Memorandum of Understanding.
b. Inspect and place in proper operating condition all gaging stations and measuring facilities.
c. New rating curves for stream gages below Percha Dam shall be provided by the Water Accounting Division prior to each flood season. In case of a flood, the Water Accounting Division shall have all active rating curves on file.
d. Check and service communication and electrical equipment:
    (1) Emergency power supply units (American and International Dams).
    (2) Auxiliary mobile and base radio units.
    (3) Remote stage transmitting systems.
    (4) Cellular/satellite telephones, battery chargers, cigarette lighter adapters.
    (5) Personal Protection Equipment (PPE).
e. Check and service stream gaging equipment:
    (1) Bridge and cableway station markings.
    (2) Sounding weights.
    (3) Sounding reels.

(4) Sounding cranes.
(5) Counter weights.
(6) Meter carrying case shall include:
  (a) Meter and rating table.
  (b) DMX (Discharge Measurement Expert).
  (c) Miscellaneous accessories, tools, and repair and replacement parts.
  (d) Ensure that copies of all rating curves, procedures and all other necessary data are updated and placed in the Water Accounting Division in El Paso Headquarters.

f. Review requirements for flood operations of American and International Dams with responsible personnel - gate operations will be in accordance with Operations Manual and/or special instructions.

6. ALERT ACTIONS:

Whenever rainfall is forecast or reported to be occurring in sufficient quantity to produce a major flood below Caballo Dam, or whenever flows in the Rio Grande in the URGP area are of such a magnitude that flooding of the Rio Grande floodplain is occurring or imminent, the *Chief, Water Accounting Division*, will notify the *Principal Engineer, Operations Department*, and establish him/herself at the Flood Operations Center at the Water Accounting Division Office and alert the *AOM, URGP*, who will alert all hydrographic personnel.

The *Chief, Water Accounting Division,* shall:

a. Obtain and analyze all hydrographic data and provide the *AOM, URGP,* with river flow forecasts developed by NWS and status of all river and rainfall conditions. Keep the *Division Engineer, O&M Division,* fully informed of all conditions and data.
b. Maintain all hydrographic data in suitable form within the flood operations center on a current basis to enable understandable situation reports.
c. Contact National Weather Service in Albuquerque and Santa Teresa to exchange meteorological data, flow measurements, and flood forecasts.
d Alert the Mexican Section.

The *AOM, URGP,* shall:

a. Make assignments to Field Data Collection teams and hydrographic personnel in the Canalization and Rectification Projects.
b. Arrange for immediate coordination and activation of project personnel and equipment.
c. Check measuring and related equipment.
d. Check communications equipment.
e. Have hydrographers check measuring and related equipment while monitoring flood conditions.
f. Make all other necessary arrangements for actions during floods.

7. REQUIREMENTS AND ACTIONS DURING FLOOD:

a. As stage data is observed and collected in the field, it will be relayed as soon as possible to the Flood Operations Center with any new river stages, discharges and rainfall data.

b. Communications - to be fastest available means (cellular telephone, landline telephone, satellite telephone, fax, or two-way radio).

c. Field measurement data is to be transmitted direct to the *Chief, Water Accounting Division,* where all data will be recorded on proper forms.

d. Stage and/or discharge hydrographs are to be kept current for analyzing, comparing and forecasting purposes. See **Exhibit 4** for Project gaging stations (water stage gages / recording stations) used for forecasting purposes.

e. *Chief, Water Accounting Division,* will prepare, review and coordinate river forecasts with the National Weather Service.

f. The *Chief, Water Accounting Division,* will ensure that flood information and river forecasts are logged and transmitted as necessary to each of the following:

   (1) *URGP, Division Engineer, O&M, and Principal Engineer, Operations.*

   (2) National Weather Service, Fort Worth, Albuquerque and El Paso (see **Exhibit 5**).

   (3) IBWC, Mexican Section.

g. Field Data Collection teams shall stake high water marks (HWM) at the time of the peak stage, or shortly thereafter, at each point, if possible. High water marks shall be established near bridge structures, diversion dams, gaging stations, and landmarks along the river and levees.

h. The *AOM, URGP,* will arrange for a flood damage survey.

i. Reports of unusual discharges into the river such as, untreated effluent or spills of industrial hazardous waste products shall be reported and documented with photographs and a written description to the *Principal Engineer, Operations,* affected Cities (El Paso, Las Cruces, Hatch, etc.), the Texas Commission on Environmental Quality or the New Mexico Environment Department.

j. Adhere to safety procedures as outlined by OSHA regulations to prevent accidents and injuries.

8. PHOTOGRAPHIC COVERAGE:

During floods, the *AOM, URGP,* shall determine in consultation with the *Division Engineer, O&M Division,* the extent of aerial photo coverage necessary and make arrangements for securing such documentary evidence, to include obliques as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

9. REQUIREMENTS AND ACTIONS AFTER FLOODS:

a. Elevations and locations of high water marks (HWMs) will be documented by survey crews as soon as possible before the marks are destroyed.
   (1) Obtain several HWMs to substantiate the validity of the high water profile.
   (2) Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
   (3) Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
   (4) Indicate the nature of the HWM used, such as dirt, and/or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b. Review high water profiles as soon as data are available so questionable elevations can be field checked before marks have been destroyed.

c. A final and comprehensive damage report will be prepared, with the assistance of the U.S. Army Corps of Engineers, if so requested, in accordance with MOU with that Agency dated November 27, 1990 (see **Exhibit 6**).

d. The *Chief, Water Accounting Division*, shall prepare a final report of the flood from the beginning to the end, with critical and constructive suggestions for future reference and guidance.

PART B
LEVEE AND STRUCTURE MAINTENANCE OPERATIONS

1. MISSION: To save lives and property by:

a. Effecting a flood vigilance and flood fight to ensure the soundness of the Upper Rio Grande Projects.
b. Maintaining security of United States levees and structures by utilizing Project forces, the employment of contractors, and the use of other agencies' equipment and personnel.
c. Coordinating operations with other United States Federal, State, County, City Agencies and other local authorities.
d. Coordinating flood information with Mexico through the responsible engineers of the United States Section and the Mexican Section.

2. RESPONSIBLE OFFICER:

The *AOM, URGP,* is the responsible officer, and reports to the *Division Engineer, O&M Division*.

3. FLOOD OPERATIONS CENTER:

The center of all flood operations will be located in the Flood Operations Center within the Emergency Operating Center at the USIBWC Headquarters Building. The flood-fighting operations center is located at the American Dam/Carlos Marin Field Office.

4. ORGANIZATION:

See Flood Emergency Organizational Chart (Page 4).

5. PREPARATORY REQUIREMENTS - BEFORE FLOOD SEASON:

Actions to be taken **Prior to June 1st of Each Year:**

a. Post Flood Warning Notices in local Post Offices and newspapers. See **Exhibit 10** for an example.
b. Check organization, instructions, supplies and equipment.
    (1) Establish 12-hour shifts with assignments to each employee (see **Exhibit 1**).
    (2) Make personnel assignments and plans to employ additional personnel, if needed.
    (3) Check and service communications and electrical equipment.
        (a) Emergency power supply units (American and International Dams).
        (b) Auxiliary mobile and base radio units.
        (c) Availability of cellular phones.
    (4) Check equipment and arrange for additional equipment, if needed.
    (5) Check supplies, sandbags, and arrange for additional supplies if needed.
    (6) Check and service, as required, the mechanical sandbag filling machine.

(7) Instruct all personnel on flood-fighting methods and operations (see **Exhibit 11 through Exhibit 14**).

(8) TRAINING: Periodic classes on gage reading, structure operation, danger signs and radio communications as well as the 24-hour military time system should be conducted for all patrol persons. The general instructions for patrol persons, flood patrols, and flood fighting (see **Exhibit 11 through Exhibit 14**) will be reviewed and discussed with the patrol persons. The *AOM, URGP*, will make certain that each patrolperson knows the sector that he will patrol in the event of a flood. This includes knowing the location and number of gages he will be required to read.

c. Review requirements of operation of diversions dams with supervisor and operators - gate operations will be conducted in accordance with instructions from Headquarters Office (should be agreed upon by both Sections and the El Paso Irrigation District).

d. Review requirements of operation of floodgates at the following bridges: Canutillo, Borderland, Country Club, and Ft. Hancock. Inspect all flood gates for proper operation and perform any required preventive maintenance.

e. Sources of assistance (equipment and men) - check with and obtain from local contractors, Irrigation Districts, and Border Patrol, a current list of available equipment and personnel for use during flood emergency operations (see **Exhibits 21 and 23**).

f. Federal, State, Counties, Cities, Irrigation Districts and other authorities will be contacted and requested to perform the tasks as specifically assigned to them. See **Exhibits 21 and 23** for telephone listings and **Exhibit 18** for special responsibilities of other entities.

(1) **Each City** - Conduct an annual joint inspection with each City of all closure devices (slide gates, flap gates, etc.) to ensure proper operation and to provide training to personnel. See **Exhibit 9, "Memorandum of Understanding Between the USIBWC and the City of El Paso."** Maintain local levees (other than Federal levees).

(2) **Irrigation Districts and Licensees** - Conduct an annual joint inspection of all closure devices (slide gates, flap gates, etc.) to ensure proper operation and to provide training to personnel. See the following: **Exhibit 7, "Joint Powers Agreement Between the Elephant Butte Irrigation District and the IBWC; Exhibit 8, "Memorandum of Understanding Between the USIBWC and the El Paso County Water Improvement District No. 1."**

6. ALERT ACTIONS:

During the summer monsoon season (June through October) and whenever there has been sustained and repeated rainfall in the contributing Rio Grande watershed, or when rainfall is forecast or reported to be occurring in sufficient quantity to produce a flood below Caballo Dam the *Division Engineer, O&M Division,* will declare an **"ALERT"**, place all Project personnel on **"STAND-BY ALERT"** status, and:

a. Test emergency generators and communications equipment.

b. Insure flood supplies are available and ready; check on the availability of additional flood supplies, such as sandbags and sand.

c. As conditions warrant, alert, inform, and discuss the situation and responsibilities with other Federal agencies (National Weather Service, Office of Emergency Planning, Border Patrol, etc.); State agencies (Emergency, Police, Highway); local agencies (County, City

and Irrigation Districts); Railroads; and Licensees. **Coordinate the closure of any required storm drains, floodgates and other gated structures with the City of El Paso, Irrigation Districts and the Texas Department of Transportation (TxDOT) which would cause flooding outside of the levee system.** See **Exhibits 21, 22 and 23** for telephone listings of agencies.

7. REQUIREMENTS AND ACTIONS DURING FLOOD

a. **IBWC, United States Section - Flood Fight Operations**
   (1) Operate on two 12-hour shifts, as required (see **Exhibit 1**).
   (2) The *AOM, URGP*, shall determine patrol needs and locate patrols in their assigned sections to report in **hourly** (or more often if required) on (see **Exhibit 14** for Flood Patrol Sectors):
      (a) Gage readings along levee (see **Exhibits 4 and 14**).
      (b) Watch for critical sections.
         (1) Hatch and Rincon Siphons
         (2) Mesilla Dam
         (3) Below Leasburg
         (4) Selden Canyon
         (5) Tributary Arroyos (Broad, Crow, Placitas)
         (6) Canutillo Bridge Area - bridge encroachment
         (7) Courchesne Bridge encroachment
         (8) Sunland Park floodplain
      (c) Critical problems:
         (1) Freeboard
         (2) Erosion along levees
         (3) Boils or seepage on landside of levee
         (4) Erosion at bridges
         (5) Structures through levees
   (3) Maintenance crews and equipment shall be on stand-by as directed by the *AOM*..
   (4) Establish sandbagging operations with trucks, front-end loader and mechanical sandbag filling machine, as needed.

b. Contract Personnel and Equipment. **Only *Division Engineer, O&M Division,*** will arrange for contract work through the Acquisition Division**.**

c. Coordinate flood operations of cities and water districts, and assist to extent possible.

d. Time System - when 24-hour per day operations begin, all personnel shall go to a 24-hour military time system, based on local time (see **Exhibit 1**).

e. All project supervisors will keep log of pertinent events and actions with date, time, location, and description for use in preparing flood reports.

f. Federal, State, Counties, Cities, Irrigation Districts and other authorities will be contacted and requested to perform the tasks as specifically assigned to them. See **Exhibits 21 and 23** for telephone listings and **Exhibit 18** for special responsibilities of other entities.
   (1) **Texas Department of Transportation** - close bridges on U.S. and State roads when necessary.
   (2) **New Mexico Department of Transportation** - close bridges on U.S. and State roads when necessary.

(3) **Each City** - close storm drains and other structures which would cause flooding of that City. See **Exhibit 9, "Memorandum of Understanding Between the USIBWC and the City of El Paso."** Maintain local levees (other than Federal levees). Close international bridges when necessary.

(4) **Irrigation Districts and Licensees** - operate drainage structures as assigned. See the following: **Exhibit 7, "Joint Powers Agreement Between the Elephant Butte Irrigation District and the IBWC; Exhibit 8, "Memorandum of Understanding Between the USIBWC and the El Paso County Water Improvement District No. 1."**

(5) **Each County** - close County bridges/roads when necessary.

8. PHOTOGRAPHIC COVERAGE:

During floods, the *AOM, URGP,* will determine in consultation with the *Division Engineer, O&M Division,* the extent of aerial photo coverage necessary and make arrangements for securing such documentary evidence, to include obliques as well as vertical photographs needed. Photographs or slides needed to illustrate phases of flood or special report should be taken by IBWC personnel when opportunities present themselves. Sufficient notes should be kept to identify pictures with location, date, and other pertinent data.

9. REQUIREMENTS AND ACTIONS AFTER FLOOD:

a. Elevations and locations of high water marks (HWMs) will be documented by survey crews as soon as possible before the marks are destroyed.
   (1) Obtain several HWMs to substantiate the validity of the high water profile.
   (2) Avoid determination of a water level from a questionable mark with respect to its representing the true water surface.
   (3) Grade the quality of the HWMs with respect to its representing the true water surface such as excellent, good, and fair.
   (4) Indicate the nature of the HWM used such as dirt, and/or sand line, drift line, wash line, etc., and whether on upstream or downstream of the structure or landmark.

b. Review high water profiles as soon as data are available so questionable elevations can be field checked before marks have been destroyed.

c. A final and comprehensive damage report will be prepared, with the assistance of the U.S. Army Corps of Engineers, if so requested, in accordance with the Memorandum of Agreement with that Agency dated November 27, 1990 (see **Exhibit 6**).

d. The *Chief, Water Accounting Division,* and the *Division Engineer, Engineering Services Division,* will prepare a final report of the flood from the beginning to the end, with critical and constructive suggestions for future reference and guidance.

5 U.S.C. 552(B)(7)(E) AND (F)

EXHIBIT 2
UNITED STATES SECTION
HYDROGRAPHIC PERSONNEL

Billy Finn, Headquarters
Cliff Regensberg, Headquarters
Adrian Cortez, Headquarters
Alejandro Luna, American Dam
Antonio Sanchez, Presidio
Esequiel Bustamante, Amistad
Jaclyn Negro, Amistad
Glenn Smith, Amistad
Raul Garcia, Falcon
Eli Mendoza, Falcon
Jose Bazaldua, Mercedes
Frank Lazo, Mercedes
Larry Pena, Mercedes

EXHIBIT 3
EQUIPMENT UTILIZED BY FIELD DATA COLLECTION TEAM

MEASURING EQUIPMENT:

It is very unlikely that all four Field Data Collection Teams will be sent to the field at the same time; however, equipment should be available for at least 2 teams. Each team should be equipped with the following items as furnished by the URGP:

Quantity	Equipment
1	USIBWC vehicle with mobile radio
48	Wooden stakes (24-inches)
2	Cans of irradiant spray paint
1	Flashlight or spotlight and batteries
1	Spool of marking tape
1	Plug-in floodlight
1	Keys for gates on river levees
1	100 ft. nylon rope
1	Keys for gaging stations
1	Hip boots or waders
1	Pair of binoculars

Necessary tools, such as 3 lb. hammer, 50 ft. measuring tape, raincoats (5), rounded shovel, life preserver, gaging station keys. Also, supplies such as notebooks, clipboards, pencils, pens, and camera.

Team leaders are responsible for making sure that all equipment has been obtained from American Dam and Headquarters, along with the following information collected by each leader:

Project map for locating high water marks
Flood Emergency Operations Manual

EXHIBIT 4
UPPER RIO GRANDE PROJECTS
GAGING STATIONS

STATION NUMBER	RIVER MILE MARKER	LOCATION
08-3633.00	73.8 AAD	Hayners (Toñuco) Bridge Gaging Station
08-3635.00	60.9 AAD	Leasburg Gaging Station (Below Leasburg Bridge)
RGBMES	37.38 AAD	Mesilla Gaging Station (Below Mesilla Dam)
08-3639.00	12.71 AAD	Canutillo Bridge
08-3640.00	1.73 AAD	El Paso Gaging Station (Above Courchesne Bridge)
08-3645.00	1253.96	American Dam
08-3650.00	1253.35	Below American Dam Gaging Station
	1251.85	International Dam
	1238.37	Ysleta - Zaragoza Bridge
08-3705.00	1173.22	Fort Quitman Gaging Station

** ”AAD” denotes Above American Dam

EXHIBIT 4 (Cont.)
UPPER RIO GRANDE PROJECTS
GAGING STATIONS

The following are driving directions to the three most difficult gaging stations to locate:

Hayner (Toñuco) Bridge Gaging Station

Begin at El Paso, Texas and travel north on I-10 West towards Las Cruces, New Mexico. Before arriving at Las Cruces, take Exit 144, I-25 North then exit at "Radium Springs" - Exit 19. Turn left and travel west along Fort Selden Road and take a right at North Valley Drive (Hwy 185). Travel north for approximately 11.9 miles along Hwy 185 to Mile Marker 26. From Mile Marker 26, continue driving along Hwy 195 for approximately 0.3 miles then turn right on a dirt road after passing a pecan orchard. Travel east towards the river along a dirt road (drive in front of a pink house) for approximately 0.15 miles. Turn right and travel south (downstream) 0.1 miles to the gaging station. See Figure 1 for location map.

Leasburg Gaging Station

Begin at El Paso, Texas and travel north on I-10 West towards Las Cruces, New Mexico. Before arriving at Las Cruces, take Exit 144, I-25 North then exit at "Radium Springs" - Exit 19. Turn left and travel west along Fort Selden Road and take a left at North Valley Drive (Hwy 185). Travel for 0.2 miles south along North Valley Drive and take a right after crossing a drain and drive along left bank of drain towards the Rio Grande. Take a left at the Rio Grande and travel south to the gaging station. See Figure 2 for location map.

Fort Quitman Gaging Station

Begin at El Paso, Texas and travel on I-10 East towards Ft. Hancock, Texas. Pass Ft. Hancock, Texas and take Exit 87. Travel south along FM 34 for approximately 2.4 miles and turn right at FM 192. Travel west for approximately 0.52 miles and turn left when you see set of mailboxes, then travel south along dirt road to Rio Grande and onto spur levee. From Rio Grande, continue driving south-east along levee road for approximately 4.26 miles to the gaging station. See Figure 3 for location map.

Figure 1 - Hayner/Tonuco Gaging Station

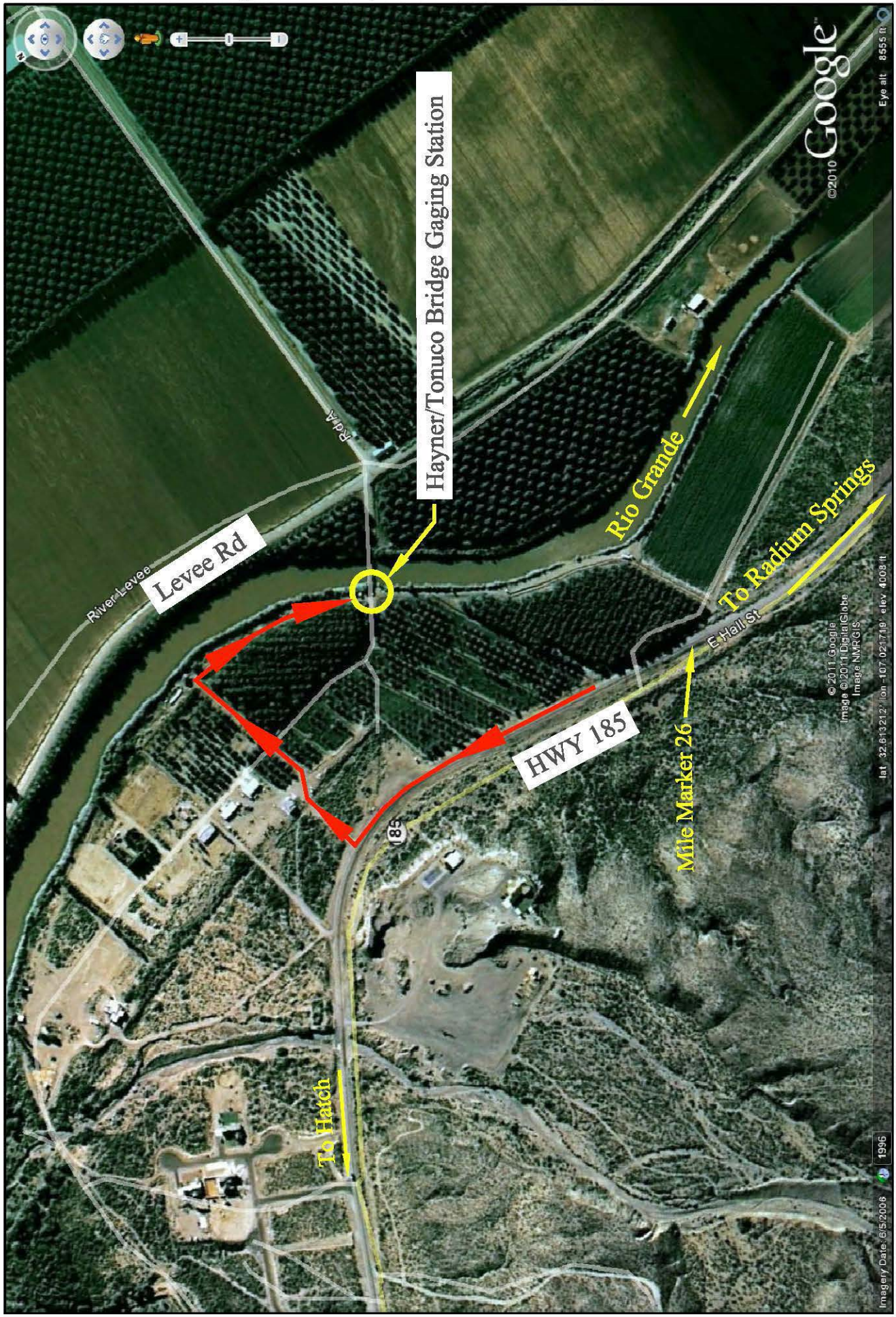


Exhibit 4 - Upper Rio Grande Projects - Gaging Stations

Figure 2 - Leasburg Gaging Station

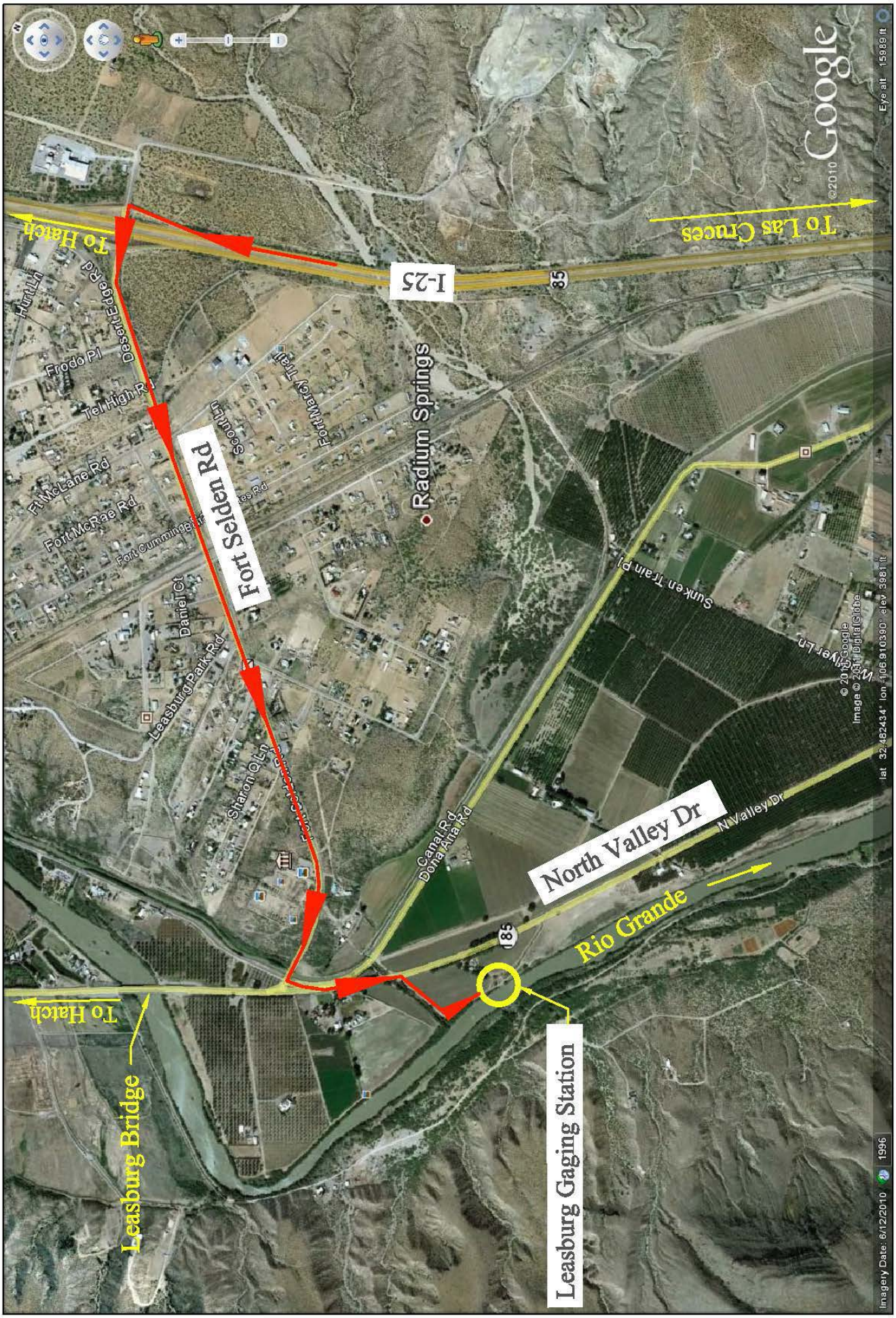


Exhibit 4 - Upper Rio Grande Projects - Gaging Stations

Figure 3 - Ft. Quitman Gaging Station

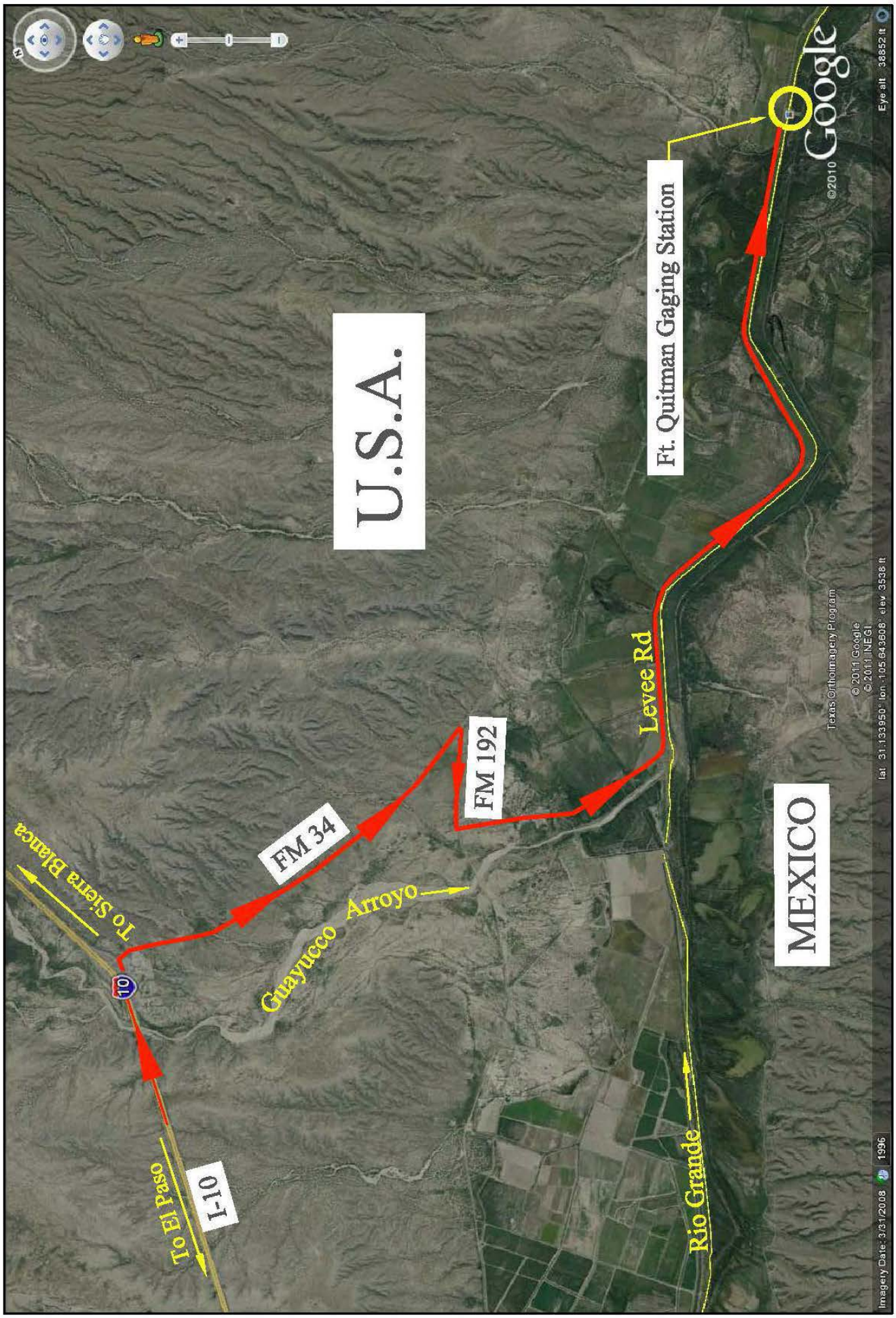


Exhibit 4 - Upper Rio Grande Projects - Gaging Staions

EXHIBIT 5

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE NATIONAL WEATHER SERVICE AND THE USIBWC

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE SOUTHERN REGION
819 Taylor Street, Room 10E09
Fort Worth, TX 76102
Contract No. IBM-98-42

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO AND THE SOUTHERN REGION NATIONAL WEATHER SERVICE, NOAA, DEPARTMENT OF COMMERCE

This Memorandum of Understanding (MOU) is made by and between the United States Section, International Boundary and Water Commission, United States and Mexico, hereafter referred to as "SECTION," of El Paso, Texas and the Southern Region National Weather Service, NOAA, Department of Commerce, hereafter referred to as "SERVICE" of Ft. Worth, Texas.

WITNESSETH:

WHEREAS, a reliable assimilation of hydrologic data from the tributaries of the Rio Grande and the main stem of the Rio Grande is necessary for the SERVICE to adequately forecast river flows on the International Rio Grande and its tributaries so that the SECTION can adequately operate the international flood control dams and diversion structures jointly with the Mexican Section of the IBWC to prevent or control flooding along the Rio Grande; and

WHEREAS, a reliable network of reporting rainfall and river stations in the Devils and Pecos River Basins has been recognized by both the SECTION and the SERVICE as essential to the proper operation of Amistad Dam upstream of Del Rio, Texas, and

WHEREAS, The Federal agencies are authorized under the Economy Act, 31 U.S.C. 1535 and 22 U.S.C. 277 et seq.; and

WHEREAS, The SERVICE possesses the capabilities to provide for the measurement of precipitation, preparation of river and weather forecasts, and reporting thereof to the public and to other agencies; and

NOW THEREFORE, the parties hereto agree as follows:

ARTICLE I: SECTION

The following services will be provided by the SECTION:

A. During a flood event, the SECTION Flood Operations Center will relay Mexican and U.S. river flows, rainfall, reservoir elevations, reservoir storage and reservoir discharge data to the appropriate SERVICE Offices identified in ADDENDUM 1 as soon as received via telephone, fax, or e-mail communications. Said SERVICE Offices are responsible for the immediate relay of such data to the West Gulf River Forecast Center (WGRFC).

B. Provide news media releases concerning actual or anticipated flood operations involving the international dams, and diversions of flood flows into the United States and Mexico's interior floodways in the Lower Rio Grande Valley.

ARTICLE II: SERVICE

The following services will be provided by the SERVICE:

A. Through WGRFC be responsible for predicting stage and flows for the Rio Grande main-stem and its major tributaries. It is understood that hydrologic data out of Mexico is limited, and the lack of such information in near-real time, makes such efforts difficult. However, the WGRFC will attempt river forecasts, to the extent that hydrologic information allows, as necessary to forecast stage and flow along the river system below El Paso.

B. Maintain the Devils-Pecos Data Collection Platform Network (DPDCPN) to assure accurate hydrologic data transmissions to the Geostationary Operational Environmental Satellite (GOES) from the network's stream and rainfall gages.

C. Provide the SECTION with computer access to GOES hourly data from stream and rainfall gages in the DPDCPN, when needed.

D. Provide information on rainfall amounts, observed or radar estimated, in the Rio Grande Basin, including Mexico, equal to or greater than one inch, via the WGRFC and/or the SERVICE offices in El Paso, Midland, Austin/San Antonio, Corpus Christi, or Brownsville, when flooding is likely or imminent to occur in the Rio Grande Basin, from El Paso downstream.

E. The WGRFC will create a Web Page or other computer based graphic showing 6 and 24 hour Quantitative Precipitation Forecasts (QPF) for the State of Texas. These QPFs will be updated twice daily, usually by 8 a.m. and 8 p.m. During periods of a major flood the WGRFC will serve as a primary contact for hydrometeorological advice to SECTION Headquarters, providing briefings to SECTION staff as necessary. WGRFC normal working hours are 6 a.m. to 10 p.m., seven days per week, expanding to full 24 hour coverage if major flood conditions so dictate.

F. Provide to appropriate offices of the SECTION identified in Addendum 1, forecasts of flood flows on the Rio Grande and its tributaries, from El Paso downstream. Direct WGRFC communication with these offices is authorized if circumstances so dictate.

G. The SERVICE offices responsible in Rio Grande Basin will coordinate with the SECTION before making press releases regarding flood operations involving the international dams and interior floodways in the Lower Rio Grande Valley if such releases are a necessary part of the public flood warning.

ARTICLE III: AMENDMENTS

This MOU may be modified at any time by written agreement of both parties. Either party may request a review of the contents of this agreement, at any time, to provide recommendations for amendments.

ARTICLE IV: INTERAGENCY COMMUNICATIONS

To provide for consistent and effective communication between both parties, each agency shall immediately designate representatives to serve as the points of contact on all matters relating to this MOU. Each agency will advise the other agency of the names and telephone numbers of the representatives designated.

Annual coordination meetings between the SERVICE and the SECTION may provide an opportunity to discuss and clarify specifics related to this memorandum and make necessary changes.

IN WITNESS WHEREOF, the parties hereto execute this instrument to be effective when signed by both parties.

UNITED STATES SECTION
INTERNATIONAL BOUNDARY AND WATER COMMISSION

Date: 11/24/98 Pamela J. Ahrens

Pamela J. Ahrens
Chief, Acquisition Division
United States Section,
International Boundary and Water Commission,
United States and Mexico

Date: 11/2/98

X. William Proenza
Acting Regional Director
Southern Region National Weather Service
NOAA, Department of Commerce

ADDENDUM 1 TO CONTRACT NO. IBM-98-42

Appropriate SERVICE and SECTION Contacts

This Addendum to the Memorandum of Understanding (MOU) between the United States Section, International Boundary and Water Commission, United States and Mexico, and Southern Region National Weather Service is made this 7th day of October 1998, and defines the appropriate contacts between the two agencies. This Addendum will be updated annually, as necessary, after the flood coordination meeting between the SECTION and the SERVICE.

Item 1. When reports, or radar estimates, of heavy rainfall, or reports of flood are received by the SERVICE, or if the SERVICE forecasts significant flows, the SERVICE will contact the appropriate SECTION Office as follows:

NWSO El Paso will notify SECTION Headquarters in El Paso for the Rio Grande drainage above Candelaria, and also serve as an Internet point of contact for hydrometeorological information.

NWSO Midland will notify the SECTION Office at Presidio or the El Paso Headquarters for the drainage from Candelaria downstream to, and including Johnson Ranch. This includes the Rio Conchos drainage in Mexico from Luis Leon Reservoir downstream to the Rio Grande near Presidio. NWSO Midland will notify the SECTION Office at Amistad Dam for the drainage below Presidio downstream to, and including Dryden.

NWSFO Austin/San Antonio will notify SECTION Office at Lake Amistad Dam or the El Paso Headquarters for the drainage below Dryden, including the lower Pecos River, and the Devils River tributaries to Lake Amistad. The Austin/San Antonio Office responsibility extends southward to the San Antonio Crossing gage on the main-stem, and includes the Mexican tributaries.

NWSO Corpus Christi will notify SECTION Office at Lake Falcon Dam or the El Paso Headquarters for the drainage ranging from Palafox southward to Columbia Bridge and below Laredo to the Webb-Zapata county line.

NWSO Brownsville will notify SECTION Office at Falcon Dam or Mercedes, or the El Paso Headquarters for the drainage from Falcon Lake (including the Rio Salado and Rio San Juan river systems in Mexico) southward through the Lower Valley Floodway.

Item 2. The National Weather Service maintains Service Hydrologists at the Albuquerque NWSFO, Lubbock NWSFO, and Austin/San Antonio NWSFO. These hydrologists may serve, in time of flood, as additional resources to NWSO El Paso (Albuquerque), NWSO Midland (Lubbock), NWSO Corpus Christi (Austin/San Antonio), and NWSO Brownsville (Austin/San Antonio), making contact with IBWC as necessary to facilitate delivery of the NWS forecast and warning service.

Item 3. The SECTION headquarters, will in addition to the above SERVICE Offices, maintain contact directly with the WGRFC regarding critical flood information in times of major flood, and cooperate with the RFC in the formulation of river forecasts to the extent that the RFC requires SECTION advice.

EXHIBIT 6

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS AND THE USIBWC

DUPLICATE ORIGINAL

MEMORANDUM OF UNDERSTANDING
BETWEEN
SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS
AND
UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO

This Memorandum of Understanding entered into this 27th day of November 1990, between the Southwestern Division, U. S. Army Corps of Engineers, hereinafter referred to as the "Corps", and the United States Section, International Boundary and Water Commission, United States and Mexico, hereinafter referred to as the "United States Section", WITNESSETH:

WHEREAS, the United States Section is authorized under 22 U.S.C.A. Sec. 277a, as amended, to construct, operate and maintain flood control works on the Rio Grande, and is authorized under 22 U.S.C.A. Sec. 277d-12, as amended, to expend from appropriations available to it such sums as may be necessary for prosecution of emergency flood fighting and rescue operations, repairs or restoration of any flood control works threatened or destroyed by floodwaters of the Rio Grande; and

WHEREAS, the Corps has authority under 33 U.S.C.A. Sec. 701n, as amended, to expend funds and engage in emergency flood fighting, rescue operations, and repairs or restoration of any flood control works threatened or destroyed by floods, including the strengthening, raising, extending, or other modifications thereof as may be necessary in the discretion of the Chief of Engineers for the adequate functioning of the work for flood control; and

WHEREAS, in order that all domestic obligations and functions prescribed by said laws and all international responsibilities of the United States Section may be coordinated and fulfilled in the manner contemplated, it is considered to be mutually desirable to define and set forth the specific jurisdiction and functions to be exercised by the United States Section and the Corps with respect to the Rio Grande and its tributaries in the States of New Mexico and Texas.

NOW, THEREFORE, the parties hereto agree as follows:

1. The United States Section shall be the responsible agency to prosecute emergency flood fighting and rescue

operations, repairs or restoration of any flood control works of the Rio Grande (and for coordination of such activities as may be necessary with authorities of the Mexican Section of the International Boundary and Water Commission), as follows:

(a) On the main stem of the Rio Grande from Caballo Dam to the beginning of the international boundary at El Paso, Texas; then downstream to the mouth of the Rio Grande at the Gulf of Mexico, including 96 miles of river levees of the Lower Rio Grande Flood Control Project from Penitas, Texas to a point 15 miles below Brownsville, Texas.

(b) Interior floodways of the Lower Rio Grande Flood Control Project, extending 137 miles in length.

2. The Corps shall have the responsibility for flood emergency preparation, flood fighting, rescue operations, and the repair and restoration of any flood control work threatened or destroyed by floodwaters on tributaries of the Rio Grande below Caballo Dam.

3. The flood fighting resources of the Corps and the United States Section shall be available to one another upon request for such assistance. For such purpose, it is agreed that the following principles and procedures will, to the extent practicable, govern cooperation between the parties hereto:

(a) During emergencies, close liaison will be maintained between Principal Engineer of the United States Section and the appropriate Corps District Commander, or his designated representative, for the exchange of all pertinent information and basic hydrologic data.

(b) If so requested by the United States Section, assistance of the Corps will be furnished, on a cost-reimbursable basis, by the Albuquerque Engineer District in the reach of the Rio Grande from Caballo Dam to the mouth of the Pecos River; by the Fort Worth Engineer District in the reach from the mouth of the Pecos River to Falcon Dam; and by the Galveston Engineer District from Falcon Dam to the Gulf of Mexico.

(c) If so requested by the Corps, assistance will be furnished, on a cost-reimbursable basis, by authority and approval of the El Paso Headquarters of the United States Section for tributaries along reaches of the Rio Grande below Caballo Dam in the United States under jurisdiction of the said Corps.

DUPLICATE ORIGINAL

(d) Each District Commander of the Corps will designate an assistant who will represent his District in all contacts with the United States Section. The Commissioner of the United States Section will designate his representatives for all contacts with the Engineer Districts of the Corps.

(e) Each party to this Understanding will endeavor to provide the closest association and maximum cooperation and participation possible under the laws, regulations, and responsibilities governing it.

(f) It is understood that available forces of the Corps will continue, as in the past, to perform rescue work when, through any circumstance, such forces are the only ones in proximity to a scene of immediate need on the Rio Grande and interior floodways of the Lower Rio Grande Flood Control Project under the jurisdiction of the United States Section.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the date first hereinabove stated.

UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, El Paso, Texas

By _____
Dr. Narendra N. Gunaji, Commissioner

SOUTHWESTERN DIVISION, U.S. ARMY CORPS OF ENGINEERS, Dallas, Texas

By _____
Stanley G. Genega
Brigadier General, U.S. Army
Commanding General

EXHIBIT 7

JOINT POWERS AGREEMENT BETWEEN THE ELEPHANT BUTTE IRRIGATION DISTRICT AND THE USIBWC

JOINT POWERS AGREEMENT BETWEEN

THE ELEPHANT BUTTE IRRIGATION DISTRICT

AND

THE INTERNATIONAL BOUNDARY AND WATER COMMISSION UNITED STATES AND MEXICO UNITED STATES SECTION

This Joint Powers Agreement is made and entered into by and between the Elephant Butte Irrigation District (hereinafter referred to as "EBID"), and the United States Section of the International Boundary and Water Commission, United States and Mexico (hereinafter referred to as "U.S. Section"),

WHEREAS EBID is a subdivision of the State of New Mexico and an irrigation district formed under New Mexico statutes entitled "Irrigation Districts Cooperating with the United States Under Reclamation Laws", found at NMSA 1978, §73-10-1, et seq., and

WHEREAS the U.S. Section, represented by the Commissioner of the U.S. Section, has been authorized by Congress of the United States to construct, operate, and maintain the Rio Grande Canalization Project pursuant to the Act of June 4, 1936, 49 Stat. 1463, Public Law No. 648, and

WHEREAS the U.S. Section is authorized to enter into agreements with local organizations concerning operation and maintenance of the Rio Grande Canalization Project, pursuant to 22 U.S.C. 277d-29, and

WHEREAS the U.S. Section completed the removal of twenty-five (25) timber bridges located along the levees of the Rio Grande Canalization Project, which timber bridges were replaced with concrete box culverts, and

WHEREAS EBID desires to formalize an agreement to use the box culverts to convey drainage flow from the land side of the levee, from lands owned by EBID constituents, to the main channel of the Rio Grande, and

WHEREAS EBID is empowered by NMSA 1978, §73-10-1 to extend and maintain irrigation works, and

WHEREAS EBID will benefit from the box culverts and operation and maintenance of said box culverts through the more efficient transmission of water from the land side of the levee to the main stem of the Rio Grande, and

WHEREASthe U.S. Section and EBID desire to jointly operate the culvert slide gates during flood control operations, and

WHEREAS EBID and the U.S. Section desire to jointly and cooperatively exercise their governmental authority to enter into this Joint Powers Agreement in accordance with the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereby covenant and agree as follows:

1. Recitals. The above recitals are hereby incorporated into this Agreement.

2. Purpose. The purpose of this Agreement is to allow EBID to operate and maintain certain box culverts installed by the U.S. Section to efficiently convey drainage flow from adjacent lands to the main stem of the Rio Grande. The box culverts are necessary for the efficient operation of the Rio Grande, and are particularly important to EBID since if the box culverts are not operated properly, damage to surrounding farm land could quickly occur.

3. Effective Date. This Agreement is subject to the approval of the State of New Mexico Department of Finance and Administration, pursuant to the Joint Powers Agreement Act, and shall not become valid and binding until such approval has been obtained, and shall continue in force until such time as it is terminated or modified as provided herein.

4. Division of Duties & Responsibilities.

   a. The U.S. Section shall be responsible for major repairs to the box culvert structures to include: culvert boxes, gates, concrete aprons, end walls, wing walls, head walls, and major rip rap protection; and

   b. EBID will maintain the box culvert gates and perform the day-to-day preventive maintenance to the gates and structure. EBID will take the proper measures to protect the existing concrete culvert structures, slide gates, and rip rap protection, which might be damaged by any maintenance process, and in case of any damage, restore the damaged property to a condition equal to that existing before such damage was done; and

   c. EBID will operate and control the box culvert gates during normal irrigation operations for the purpose of conveying drainage flows to the Rio Grande; and

   d. EBID and the U.S. Section will have joint control and regulation of the culvert gates during flood control operations, to assure their control and proper functioning; and

e. In coordination with the U.S. Section, EBID will take primary responsibility in the operations of the culvert gates, to include the manpower needed for controlling the culvert gates during flood control operations; and

f. An annual inspection of the box culvert structures will be performed jointly, prior to the beginning of the irrigation season. The U.S. Section and the District will appoint representatives in writing. The inspection will generate a report where major repairs will be identified; and

g. The U.S. Section grants rights of ingress and egress over International Boundary and Water Commission property to EBID as shall be deemed necessary and convenient for EBID to proceed and perform any and all necessary operation and/or maintenance on these concrete box culvert structures; and

h. Attachment 1, titled: "Operating Procedures for Box Culvert Gates" shall serve as a guideline for the U.S. Section and EBID to minimize any impact during normal and flood control operations; and

i. The U.S. Section will retain real property ownership and jurisdiction of the concrete box culvert structures.

5. Method. The parties agree that the U.S. Section has removed the timber bridges and has placed the box culverts in their place. This Agreement to allow EBID to operate the box culverts in no way alters the employment status of EBID employees or U.S. Section employees who shall remain under the supervision of their respective entities, which entities will cover all employee benefits including, but not limited to, wages, fringe benefits and workers' compensation coverage associated with their employment.

6. Fiscal Matters. No funds shall pass from the U.S. Section to EBID, or from EBID to the U.S. Section, under this Agreement. Each entity shall continue to maintain strict accountability for their own receipts and disbursements pursuant to their own governing laws and statutes. No revenues will be derived from the operations of the facilities referred to in this Agreement.

7. Distribution of Property. There will be no property acquired as a result of this joint exercise of powers.

8. Responsibility. Each party shall be solely responsible for fiscal or other sanctions, penalties, or fines occasioned as a result of its own violation or alleged violation of requirements applicable to performance of its obligations under this Agreement. Each party shall be liable for its acts or failure to act in accordance with this Agreement, subject to the immunities and limitations of the New Mexico Tort Claims Act.

9. Termination. Either party may terminate this Agreement without cause upon thirty (30) days written notice to the following:

Notice to EBID: Mail by certified letter to Gary Esslinger, Manager/Treasurer, Elephant Butte Irrigation District, 530 S. Melendres, Las Cruces, New Mexico 88005.

Notice to U.S. Section: Mail by certified letter to the Commissioner, International Boundary & Water Commission, U.S. Section, 4171 N. Mesa, C-310, El Paso, TX 79902.

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, U.S. SECTION

By Sherri Bradley
Date 5-15-01

Attest: Rosy C adler

5-10-01

ELEPHANT BUTTE IRRIGATION DISTRICT BOARD OF DIRECTORS

By
Gary Arnold, President
Date 5/16/01

Attest: Mack Sloan
Mack Sloan, Secretary

APPROVED:

5/31/01
DEPT. OF FINANCE & ADMINISTRATION 5/31/01

OPERATING PROCEDURES
FOR
BOX CULVERT STRUCTURES/GATES

I. Background

The United States Section of the International Boundary and Water Commission (USIBWC) constructed and maintains the Rio Grande Canalization Project (Project) from Percha Diversion Dam in New Mexico to American Dam in El Paso, Texas. The Canalization Project assures that water released from upstream reservoirs for delivery to Mexico is in compliance with the Convention between the United States and Mexico concluded May 21, 1906 is conveyed effectively to American Dam, and also provides for protection of lands along the project from floods. The project constructed between 1938 and 1943, consists of a normal flow channel and a leveed floodway.

A number of canals, laterals and drains belonging to the Elephant Butte Irrigation District (EBID) discharge into the river through this levee system. Some of the Districts conveyance facilities discharge to the river through gated pipes and/or small size box culverts. However, the large flow conveyances are discharged to the river in open channels through the levee. These larger channels originally were bridged with timber structures.

The USIBWC replaced 25 timber bridges with pre-cast concrete box culverts, some of which are fitted with metal slide gates. Exhibit A provides a listing of the culverts and locations, and identifies the sizes of the gates that were installed. When the culvert gates are closed, these structures provide a closure system between the Rio Grande, canals, laterals, and drains during flood stage. During normal water operations, the culvert gates are left open for water to flow through these structures into the river.

PROCEDURES AND ASSIGNMENT OF RESPONSIBILITIES

II. Construction

The construction phase involved replacing 25 wooden timber bridges, with concrete box culvert structures. These structures were designed and installed by the USIBWC. EBID provided the vertical placement elevations during the design phase. The USIBWC had total responsibility for the installation and construction of these structures, to include: culvert boxes, slide gates, concrete aprons, end walls, wing walls, head walls and rip rap protection. Any major repairs to the box culvert structures will be rectified by USIBWC.

III. General Operations and Maintenance

Normal irrigation operations are defined when the flow in the Rio Grande is less than 60 percent of the Project design capacity. Flood operations are defined when the flow in the Rio Grande is above the 60 percent of the Project design capacity. See Exhibit B for flow design capacities from Percha Diversion Dam to American Dam.

During the normal ir_ _ition operations and flood control op(ions, USIBWC and EBID agree on the following Operations and Maintenance procedures for the box culvert structures:

A. Operations

1. EBID will fully operate and control the concrete box culvert gates during normal irrigation operations for the purpose of conveying drainage flows to the Rio Grande.

2. The USIBWC and EBID will have joint control and regulation of the culvert gates during flood control operations, to assure their control and proper functioning.

3. During flood control operations and in coordination with USIBWC, the EBID shall have the responsibility for the actual openings and closings of the culvert gates, to include the manpower needed for controlling the culvert gates.

4. EBID has delegated this responsibility to the irrigation operator (ditchrider) in their area of responsibility. Physical control of opening or closing the culvert gates during normal water irrigation operations and flood control operations will be under the direct supervision of the EBID Watermaster.

B. Maintenance

1. The USIBWC shall be responsible for major repairs to the box culvert structures to include: culvert boxes, gates, concrete aprons, end walls, wing walls, head wails, and major rip rap protection.

2. EBID will maintain the box culvert gates and perform day to day preventive maintenance to the gates and structure: Preventive maintenance will include but will not be limited to re-painting the culvert gates, greasing of lifting nuts and stems, straightening of bent lifting stems, and minor restoration of rip rap protection.

3. EBID will take the proper measures to protect the existing concrete culvert structures, slide gates, and rip rap protection, which might be damaged by any maintenance process, and in case of any damage, restore the damaged property to a condition equal to that existing before such damage was done.

4. EBID will maintain the box culverts free of any obstruction such as weeds, tree trunks and/or any other obstruction that may impact the flow of water.

5. An annual inspection of the box culvert structures will be performed jointly by the USIBWC and EBID representatives prior to the beginning of each irrigation season. Following the inspection, a joint report will be developed by the USIBWC and EBID representatives. The report shall identify all repairs and major discrepancies that need to be corrected on the structures.

6. Any disagree t as to responsibilities will be handle / the U.S. Section and the EBID representatives.

7. USIBWC grants rights of ingress and egress over USIBWC property to EBID as shall be deemed necessary and convenient for the EBID to proceed and perform any and all necessary operation and/or maintenance on these concrete box culvert structures.

III. Cost

All costs associated to either agency for the performance of their respective tasks as outlined in Memorandum of Understanding and Operating Procedures, shall be the responsibility of each agency.

EXHIBIT A

BOX CULVERT INFORMATION

Culvert No.	Wasteway/Drain	Gate Dimensions (in.)	Number of Gates
1	Garfield Canal/Hatch Canal (Siphon)	No Gate	No Gate
2	Rincon Canal (Siphon)	60 x 48	2
3	Hatch Drain	48 x 48	2
4	Angostura Lateral, WW #14	No Gate	No Gate
5	Angostura Lateral, WW #15	48 x 48	1
6	Seldon Drain	48 x 48	1
7	American Bend Lateral, WW #2	48 x 48	1
8	Picacho Canal, WW #3 (Flume)	No Gate	No Gate
9	Leasburg Canal, WW #5	60 x 48	2
10	Picacho Lateral, WW #39	60 x 60	4
11	Leasburg Extension Lateral, WW #8	48 x 48	3
12	Mesilla Lateral, WW #11	60 x 60	2
13	Eastside Lateral, WW #15	48 x 48	2
14	Upper Chamberino Lateral, WW #27	60 x 72	2
15	Chamberino East Lateral	48 x 48	1
16	Eastside Lateral, WW #18	48 x 48	2
17	Three Saints Main Canal, WW #19	48 x 48	2
18	La Mesa Drain	48 x 48	2
19	La Union Main Canal, WW #31	60 x 60	3
20	Three Saints Main Canal, WW #20	60 x 48	1
21	Three Saints Main Canal, WW #21	60 x 48	1
22	La Union East Lateral, WW #32	60 x 60	2
23	East Drain & Texas Lateral, WW #23A	60 x 48	2
24	Canutillo Lateral, WW #34	60 x 48	1
25	Combined La Union Lateral, WW #35	60 x 48	1

EXHIBIT B

FLOOD DESIGN CAPACITY OF THE RIO GRANDE CANALIZATION PROJECT

Percha Diversion Dam to American Dam

Location	Design Capacity (cfs) Beginning of Section	End of Section
Percha Dam to Trujillo Arroyo	13,000	13,000
Trujillo Arroyo to Jaralosa Arroyo	16,000	18,000
Jaralosa Arroyo to Placitas Arroyo	20,000	20,000
Placitas Arroyo to Angostura Arroyo	21,000	21,000
Angostura Arroyo to Tonuco Cut-Off	21,000	21,000
Tonuco Cut-Off to Leasburg Dam	(No Construction)	
Leasburg Dam to Picacho Flume	17,000	16,000
Picacho Flume to Mesilla Dam	16,000	15,000
Mesilla Dam to Mesquite Bridge	15,000	15,000
Mesquite Bridge to Vado Bridge	14,000	14,000
Vado Bridge to Berino Bridge	13,000	13,000
Berino Bridge to American Dam	12,000	12,000

EXHIBIT 8

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE USIBWC AND THE EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1

MEMORANDUM OF UNDERSTANDING
BETWEEN
UNITED STATES SECTION
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES AND MEXICO
AND
EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1
REGARDING
OPERATION OF DRAINAGE STRUCTURES

This Memorandum of Understanding hereinafter referred to as "MOU" constitutes an agreement between the United States Section, International Boundary and Water Commission, United States and Mexico, hereinafter referred to as "USIBWC," as represented by the Commissioner of the USIBWC in El Paso, Texas, and the El Paso County Water Improvement District No. 1, a political subdivision of the State of Texas, acting herein by and through the BOARD OF DIRECTORS, (hereinafter referred to as "EPCWID"), as represented by the President of the Board, collectively referred to as the parties to this agreement.

WITNESSETH

WHEREAS, the USIBWC is authorized to construct, operate and maintain any project or works projected by the United States of America within the Upper Rio Grande Flood Control Project (hereinafter referred to as "URGFCP"), as authorized by TS 864, 48 Stat. 1621, and codified at 22 U.S.C. Section 277, 277a, 277b, 277c, and Acts amendatory thereof and supplementary thereto; and

WHEREAS, the construction, operation and maintenance of URGFCP works is in furtherance of the provisions of Minutes 129, 144, 148, 165 and 174 of the International Boundary & Water Commission regarding improvement of international flood control works on the Upper Rio Grande; and

WHEREAS, pursuant to 22 U.S.C. Sections 277b and 277c the USIBWC is authorized to enter into agreements in connection with the construction, operation and maintenance of any flood control project or works on the URGFCP with state and local political subdivisions within which such project or works may be in whole or in part situated upon; and

WHEREAS, EPCWID is authorized to enter into this agreement pursuant to Tex. Water Code Ann. § 49.211 (2003); and

WHEREAS, the USIBWC has in place a contract with EPCWID to rehabilitate three drainage structures in the Rio Grande Rectification project under MOU IBM07A0010 and wishes to certify the U.S. levee to FEMA standards as prescribed in 33 CFR 65.10; and

WHEREAS, EPCWID operates and maintains irrigation drainage structures within the USIBWC Rio Grande Canalization and Rectification Projects under responsibilities delegated to them by the US Bureau of Reclamation under Contract No. 0-07-54-X0904, and

WHEREAS, EPCWID and USIBWC desire to formalize an agreement to use drainage structures to convey drainage flow from the land side of the levee from lands owned by EPCWID constituents to the main channel of the Rio Grande, and

WHEREAS, EPCWID will benefit from the operation and maintenance of said drainage structures through efficient transmission of water from the land side of the levee to the main stem of the Rio Grande, and

WHEREAS, USIBWC and EPCWID desire to coordinate the operation of drainage structures during river flood control operations; and

WHEREAS, Both parties agree that no funds or charges are to be expensed or assessed against either party as a result of this MOU.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereby covenant and agree as follows:

ARTICLE I. BACKGROUND AND PURPOSE

A number of canals, laterals and drains belonging to the EPCWID discharge into the river through the levee system of the URGFCP, whereas other conveyance systems discharge to the river through gated pipes and/or small size box culverts. Attachment 1 to this MOU provides a listing of the aforementioned culverts coupled with their locations, and identifies the sizes of those structures. When the culvert gates are closed, these structures provide a closure system between the Rio Grande, and canals, laterals, and drains during flood control operations. During normal water operations the culvert gates are left open for water to flow through those structures into the river.

The purpose of this MOU is to facilitate the coordination and operation of aforementioned gates and drainage structures during normal irrigation as well as flood control operations in order to efficiently and safely convey drainage flow from adjacent lands to the main stem of the Rio Grande and prevent flood flows in the Rio Grande from entering adjacent farmland. Normal irrigation operations are defined as flow in the Rio Grande less than 60 percent of the URGFCP design capacity. During flood control operations, when the flow in the Rio Grande is above 60 percent of the URGFCP design capacity, the EPCWID and USIBWC will coordinate the operation of the gates and drainage structures.

Article II. USIBWC'S RESPONSIBILITIES

1. USIBWC will notify EPCWID whenever flows in the Rio Grande are projected to be 60% of the design capacity of URGFCP; and

2. USIBWC will coordinate with EPCWID to ensure proper utility of drainage structures during flood control operations; and

3. USIBWC will grant EPCWID the right of ingress and egress over USIBWC property to perform any and all necessary operations and/or maintenance on EPCWID structures listed on Attachment 1; and

4. USIBWC will designate a Representative and an alternative representative authorized to act on USIBWC's behalf with regard to any provision in Articles I and II within ten (10) calendar days after execution of this MOU.

5. USIBWC will participate in a joint annual inspection of the drainage structures, prior to the beginning of the irrigation season. The inspection will generate a report, prepared by the EPCWID, where major repairs will be identified.

Article III. EPCWID RESPONSIBILITIES

1. EPCWID will perform day-to-day preventative maintenance on culvert gates and drainage structures, including but not limited to re-painting culvert gates, greasing lifting nuts and stems, and straightening bent lifting stems. EPCWID will also conduct a joint inspection with USIBWC of aforementioned drainage structures at least once a year prior to flood season, which commences on June 1 of every year. The EPCWID will provide a report listing condition of each structure, and which structures require major repairs.

2. EPCWID will take proper measures to protect USIBWC owned levee and appurtenant works, and if damaged by EPCWID or its affiliates will restore aforementioned to a condition equal to that existing before such damage; and

3. EPCWID will operate and control drainage structures during normal irrigation operations in order to convey drainage flows to the Rio Grande; and

4 5. EPCWID will have in place procedures which will provide timely notice to EPCWID personnel regarding unusual events that may cause flooding conditions in EPCWID drains to allow EPCWID personnel adequate time to operate and control drainage structures and/or provide alternate means to convey drainage flows to the Rio Grande to prevent residential or agricultural flooding on the landside of the levee; and

5 6. EPCWID will consult with USIBWC during river flood control operations to insure that structures listed on Attachment 1 are functional and shall close all gates on drainage structures when advised by USIBWC pursuant to Article II, Number 1; and

6 7. EPCWID will designate a Representative and an alternative Representative authorized to act on EPCWID's behalf with regard to any provision in Articles I and II within ten (10) calendar days after execution of this MOU.

ARTICLE IV. DURATION AND MODIFICATION OF MOU

This MOU will take effect when signed by the both parties hereto and shall remain in effect unless terminated, in writing by one or both parties after 60 days notice. This MOU may be modified at any time by written agreement of each party and does not restrict either party from enforcing any laws or regulations within its authority or jurisdiction.

FOR THE USIBWC

DATE: 01/2/08

Colleen Burns
Contracting Officer,
United States Section,
International Boundary and Water Commission,
United States and Mexico

DATE: 1/2/08

Diana Forti
Chief Administrative Officer
United States Section,
International Boundary and Water Commission,
United States and Mexico

FOR THE EPCWID

DATE: 1/16/08

Johnny Stubbs, President of EPCWID

ATTACHMENT 1

The El Paso County Water Improvement District No. 1 operates and maintains the drainage structures listed below.

IBWC Levee Sta.	**Rio Grande Project Drainage Structures**
120+52.55	Ascarate WW (4 - 4'x5'x44' Conc. Box Culvert)
284+50	Riverside Canal WW #1 (5 - 5'x6'x38' Conc. Box Culvert)
401+11.52	Riverside Canal WW #2 (3 - 5'x6'x38' Conc. Box Culvert)
590+82.79	Fabens Canal WW (4 – 5'x5'x57' Conc. Box Culvert)
714+25	County Line (Tornillo) WW (5 - 4'x4'x62' Conc. Box Culvert)

IBWC Levee Sta.	**Rio Grande Canalization Project Drainage Structures**
1155+91.99	Rowley Lateral WW (36" x 64' Conc. Pipe)
1250+65.70	Vinton WW (36" x 54' RCP + 12' Iron Pipe)
1561+52	Pence Lateral WW 34-A (30" x28' Conc. Pipe)

EXHIBIT 9

MEMORANDUM OF UNDERSTANDING BETWEEN THE USIBWC AND THE CITY OF EL PASO

MEMORANDUM OF UNDERSTANDING
BETWEEN
UNITED STATES SECTION
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES AND MEXICO
AND
CITY OF EL PASO
REGARDING
OPERATION OF DRAINAGE STRUCTURES

This Memorandum of Understanding hereinafter referred to as "MOU" constitutes an agreement between the United States Section, International Boundary and Water Commission, United States and Mexico, hereinafter referred to as "USIBWC," as represented by the Commissioner of the USIBWC in El Paso, Texas, and the City of El Paso, a political subdivision of the State of Texas, acting herein by and through the City Council, (hereinafter referred to as "City"), as represented by the Mayor, collectively referred to as the parties to this agreement.

WITNESSETH

WHEREAS, the USIBWC is authorized to construct, operate and maintain any project or works projected by the United States of America within the Upper Rio Grande Flood Control Project (hereinafter referred to as "URGFCP"), as authorized by TS 864, 48 Stat. 1621, and codified at 22 U.S.C. Section 277, 277a, 277b, 277c, and Acts amendatory thereof and supplementary thereto; and

WHEREAS, the construction, operation and maintenance of URGFCP works is in furtherance of the provisions of Minutes 129, 144, 148, 165 and 174 of the International Boundary & Water Commission regarding improvement of international flood control works on the Upper Rio Grande River; and

WHEREAS, pursuant to 22 U.S.C. Sections 277b and 277c the USIBWC is authorized to enter into agreements in connection with the construction, operation and maintenance of any flood control project or works on the URGFCP with state and local political subdivisions within which such project or works may be in whole or in part situated upon; and

WHEREAS, City operates and maintains drainage structures along the URGFCP under licenses and permits issued by USIBWC; and

WHEREAS, USIBWC wishes to certify the U.S. levee to Federal Emergency Management Agency standards as prescribed in 33 CFR 65.10; and

WHEREAS, USIBWC and City desire to coordinate usage of drainage structures during river flood control operations and localized interior drainage flooding in an effort to attempt to prevent river flood flows from entering the City and to convey drainage flows from the land side of the levee from lands owned by City to the main channel of the Rio Grande River, and

WHEREAS, City will benefit from the operation and maintenance of said drainage structures through efficient transmission of water from the land side of the levee to the main stem of the Rio Grande River, and

WHEREAS, Both parties agree that no funds or charges are to be expensed or assessed against either party as a result of this MOU.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the parties hereby covenant and agree as stated below.

ARTICLE I. BACKGROUND AND PURPOSE

A number of drainage structures belonging to the City discharge into the river through the levee system of the URGFCP. The City conveyance facilities discharge to the river through gated pipes and/or small size box culverts, with the large flow conveyances pumped through the levee to the river. Attachment 1 to this MOU provides a listing of the culverts and locations, and identifies the sizes of the gates installed. When the culvert gates are closed those structures provide a closure system between the Rio Grande River and residential property during river flooding. During normal water operations the culvert gates are left open for water to flow through those structures into the river.

The purpose of this MOU is to allow the City to operate and maintain the gates and drainage structures during normal rainfall events to efficiently convey storm drainage flow from lands adjacent to the Rio Grande River to the main stem of the river. Normal storm drainage flows are defined as flows in the Rio Grande River that are less than 60 percent of the URGFCP design capacity. The drainage works are necessary for the efficient operation of the Rio Grande River and are particularly important to the City. If drainage works are not operated properly, damage to surrounding residential property could quickly occur. During river flood control operations, when the flow in the Rio Grande River is at least 60 percent of the URGFCP design capacity the City and USIBWC will coordinate operation of the gates and drainage structures to effectuate structure closures; however, the prime responsibility for drainage structure closures shall remain with the City.

Article II. USIBWC'S RESPONSIBILITIES

1. USIBWC will notify City whenever flows in the Rio Grande River are projected to be at least 60% of the design capacity of the URGFCP; and

3. USIBWC will grant City the right of ingress and egress over USIBWC property to perform any and all necessary operations and/or maintenance on City structures identified on Attachment 1; and

4. USIBWC will designate a Representative and an alternative representative authorized to act on USIBWC's behalf with regard to any provision in Articles I and II within ten (10) calendar days after execution of this MOU; and

5. USIBWC will participate in a joint annual inspection of the drainage structures with the City prior to the beginning of the irrigation season, where thereafter the City will generate a report that will identify drainage structures that are in need of major repair.

Article III. CITY RESPONSIBILITIES

1. City will perform day-to-day preventative maintenance on culvert gates and drainage structures, including but not limited to re-painting culvert gates, greasing lifting nuts and stems, straightening bent lifting stems, and inspect aforementioned structures at least once a year prior to flood season, which commences on June 1 of every year, and notify USIBWC of any drainage equipment that are in need of repair, coupled with a proposed schedule that states when the City will implement such repair; and

2. City will take proper measures to protect USIBWC owned levee and appurtenant works, and if damaged by City or its affiliates will restore aforementioned to a condition equal to that existing before such damage; and

3. City will operate and control drainage structures during above normal rainfall events in order to convey drainage flows to the Rio Grande River; and

4. City will have in place procedures which will provide sufficient notice to City Personnel regarding above normal rainfall events from interior drainage areas to allow timely dispatch of City personnel to operate drainage structures to prevent flooding of City residential properties on the land side of the levee; and

5. City will consult with USIBWC during river flood control operations to insure that structures listed on Attachment 1 are functional and shall close all gates on drainage structures when advised by USIBWC pursuant to Article II, Number 1; and

6. City will ensure culverts are free of any obstructions that may impact flow of drainage water, including but not limited to weeds and tree trunks; and

7. City will designate a Representative and an alternative Representative authorized to act on City's behalf with regard to any provision in Articles I and II within ten (10) calendar days after execution of this MOU.

ARTICLE IV. DURATION AND MODIFICATION OF MOU

This MOU will take effect when signed by the both parties hereto and shall remain in effect unless terminated in writing by one or both parties after 60 days notice. This MOU may be modified at any time by written agreement of each party and does not restrict either party from enforcing any laws or regulations within its authority or jurisdiction.

FOR THE USIBWC

DATE: 2/22/08

Colleen Burns
Contracting Officer,
United States Section,
International Boundary and Water Commission,
United States and Mexico

DATE: 2/28/08

Diana Forti
Chief Administrative Officer
United States Section,
International Boundary and Water Commission,
United States and Mexico

FOR THE CITY OF EL PASO

DATE: 2/22/08

Manager, El Paso Water Board

ATTACHMENT 1

The drainage structures described below are used in an attempt to convey storm water to the Rio Grande River and are gated in an attempt to prevent flood flows from the Rio Grande River from entering the drains and residential property within the City.

The City operates and maintains the following drainage structures:

RIO GRANDE OUTLET STRUCTURES

Structure No.	Station IBWC	Station (City)	Size	Type of Discharge
3	4+376	38+44.16	2-8'x4 CULVERTS	GRAVITY
5	2+151.62	70+57.2	42 RCP	GRAVITY
7	2+622.68	86+02.39	36" RCP	PUMP
8	2+627.22	86+17.28	36"RCP	PUMP
9	3+599.16	118+05.24	24" RCP	GRAVITY
10	3+890.87	127+62.05	54" RCP	GRAVITY
11	3+890.87	127+62.05	48" RCP	GRAVITY
12	4+545.20	149+08.25	3-24" RCPs	GRAVITY
13	5+245.18	268+01.71	48" RCP	GRAVITY
13A	5+300	172+25	7'x'4 CULVERT	GRAVITY
14	5+418	177+71.04	3-24" RCPs	GRAVITY
15	6+877.44	225+58.00	4-6'x'4 CULVERT	PUMP
16	7+244.64	237+62.42	3-5'x'5 CULVERTS	PUMP
17	7+734.23	253.67.52	30" RCP	GRAVITY
18	8+052.94	264+13.64	60" RCP	GRAVITY
19	8+246.68	270+49.11	90" RCP	GRAVITY
20	8+285	271+74.80	30" RCP	GRAVITY
21	8+528.84	279+74.60	30" RCP	GRAVITY
22	8+690.71	285+05.53	24" RCP	GRAVITY
24	9+358	30+69	108" PIPE	PUMP
27	12+748	418+13.40	60" RCP	GRAVITY
30	24+998	819+93.44	2-36" RCPs	GRAVITY

EXHIBIT 10

FLOOD WARNING NOTICE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

A notice to the general public, all owners, lessees, licensees, and users of lands along the Rio Grande, between Percha Diversion Dam and American Diversion Dam, Sierra, and Doña Ana Counties, New Mexico and El Paso County, Texas

The general public, owners, lessees, and users of lands on the United States banks of the Rio Grande between Percha Diversion Dam and American Diversion Dam are hereby notified that lands along the banks of the river between the channel and levees, depending upon their elevation, are subject to periodic flooding from local tributary inflows and by releases from the Caballo Dam. This notice is given as a public service to advise and inform you that human life, property, livestock, and other activities, existing or proposed, may be subject to flood damage, and are maintained or undertaken at your own risk.

The United States Section, International Boundary and Water Commission (USIBWC) maintains the Rio Grande Canalization Project to assure irrigation deliveries and provide flood protection for lands adjacent to the project. For questions regarding the level of protection, please contact USIBWC. Please be advised that during flood conditions and/or localized heavy rainfall/runoff events, the Rio Grande will unavoidably overflow its river channel and may adversely impact interests along its banks. Please refer to your local National Weather Service office for flood information during these events.

In order to protect life and property and to avoid potential obstruction or deflection of flows within the Rio Grande floodplain, the general public, owners, lessees, and users of land along the Rio Grande are advised for their own safety and for security of their properties to contact your Sierra, Doña Ana, and El Paso County Officials and the USIBWC, 2616 West Paisano Drive, El Paso, Texas 79902, telephone number (915) 351-1030, before making any use of the lands or constructing improvements on the lands along the river.

Sincerely,

Edward Drusina, P.E.
Commissioner

EXHIBIT 11
GENERAL INSTRUCTIONS FOR PATROL PERSONS/FIELD DATA COLLECTION TEAMS

(1) Each person involved in the Field Data Collection Team must realize the extreme importance and responsibility of their part/position in the flood-fighting organization.

(2) Patrol persons should be familiar with their assigned patrol sector and check for necessary supplies before leaving on patrol.

(3) Each person on patrol, as well as others, should be alerted and instructed to observe, record, and report:

- (a) Progressive flood stages.
- (b) Boils and seeps on the landside of levees and dikes.
- (c) Slope and crown erosion from waves and currents.
- (d) Structures' condition and proper operation of same.
- (e) Pumping across levee into floodway - watch for levee erosion and pipes that should be covered to permit traffic over them.
- (f) Watch levee freeboard - report any condition that is less than four (4) feet measured vertically.

(4) Observe at all times the safety rules and safety program.

(5) Assure that equipment is at all times serviced, fueled, and ready to go at a moment's notice. It will be management's responsibility to see that equipment is strategically placed.

(6) Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sightings or condition, however seemingly unimportant.

(7) Each patrol person shall not leave their assigned post or patrol sector until relieved, unless instructed otherwise.

- (a) Each patrol team will be furnished with a log book. All gage readings, problems, emergency situations, etc. should be recorded, together with time and date. Each patrol person should sign the log book at the end of his shift.
- (b) Upon being relieved, the book shall be passed on to the relief patrol person, including information on the present situation prevailing in the particular sector, any particular work or instructions that are to be carried out during the succeeding shift, as well as information of activities and conditions during the past shift.
- (c) Each patrol person shall be expected and prepared to "double shift" if an emergency should require.

(8) Patrol areas and special instructions regarding Patrol Sectors are found in Exhibit 14, “Flood Patrol Sectors.”

EXHIBIT 12
RECOMMENDED FLOOD FIGHTING TRAINING

The AOM shall provide the proper flood fighting training on the following subjects:

(1) Gage Reading.

(2) Structure Operation.

(3) Danger Signs.

(4) Operation of Radios and Other Communication Systems.

(5) 24-Hour Military Time System.

(6) General Instructions for Flood Patrols:
- (a) Patrol Sectors.
- (b) Times of Shifts.
- (c) Location and Number of Gages to be Read.

(7) Operation of Dams to be Reviewed by Supervisors with Dam Operators.

(8) Safety Equipment and Procedures.

(9) Flood Alert Exercises.

(10) Flood Fight Procedures:
- (a) Control Sand Boils.
- (b) Wave Wash and Current Erosion.
- (c) Overtopping of Levees.

EXHIBIT 13
Flood Fighting Techniques on Levees

Exhibit 13 Contents

List of Plates

1. Introduction

If a well-constructed levee of correct cross section is properly maintained and is not overtopped, it should hold throughout any major flood event. However, the levee is still in potential danger whenever there is water against it. The danger increases with the height of water, the duration of the flood stage, the intensity of the current, and the wave action against the levee face. There are three primary factors that lead to levee failures:

1. Overtopping
2. Seepage problems such as sandboils or slides
3. Erosion from the current or waves

Potential levee failures may be prevented if prompt action is taken and proper methods of treatment are employed. This Exhibit describes some of the general actions that should be taken to raise the crown of a levee or to respond to sandboils, seepage problems, or wave wash if these problems are identified during a patrol. The methods described have been developed from many years of experience in dealing with problems that arise as a result of high water, and should be followed as closely as possible. (The intent of this isn't to destroy personal initiative when dealing with unusual emergencies. On the contrary, if a dangerous situation occurs along a levee line, immediate action is demanded using the materials and labor at hand. However, an emergency is not a time in which to experiment, and these proven methods should be employed wherever possible.)

2. Overtopping

A levee is overtopped when water flows over the levee crown. Low reaches in the levee crown must be identified as early as possible and raised to a uniform level. If the river is predicted to approach or exceed the height of the existing levee, immediate attention should be given to raising the levee crown.

On the other hand, if the river is likely to crest many feet beyond the elevation of the levee, the best approach may be to simply allow the levee to overtop, so that flood fight efforts can be redirected to other areas. If this is the case, low reaches in the levee crown need to be raised, leveled or otherwise prepared so that it overtops uniformly, to keep the damage to a minimum. Ideally, the levee should be allowed to overtop uniformly along the downstream portion of the flood control project, so the protected area is "backfilled" with flood water. If the levee is breached due to the overtopping along the downstream portion of the flood control project, it prevents the full force of the river's current from flowing into the protected area. An upstream breach will allow the river current to bring in much more debris (for example, entire trees), and would possibly cause much more scouring damage to the protected area than a downstream overtopping breach.

Generally, emergency barriers are constructed 2 feet above the current predicted river crest. For example, if the river is predicted to rise 1 1/2 feet beyond the elevation of the levee, then a 3 ½ foot capping would be necessary in order to maintain two feet of freeboard as a factor of safety. If the crest prediction increases during construction, additional height must be added.

2.1 Options for Raising a Levee

There are a number of ways that the levee crown can be raised. Provided the work is done well in advance of the high water, in areas where there is sufficient space for construction and with the proper equipment, the most efficient means of raising low stretches of the levee is to scarify the surface, haul in fill material and compact it in place. However, this is not always possible. No heavy equipment should be used on a levee when water is near the top, as the vibration may cause a failure. In no case should such equipment be allowed on an earthen levee after the levee has commenced to seep. For these reasons, raising the elevation with compacted earthen fill may not be an option. The levee crown may alternately be raised with a sandbag capping or with flashboard structures.

With many options available for raising a flood barrier, using sandbags is considered the most widely used method for the following reasons:

a. Cost of materials and labor

The materials for sandbag construction are generally much less expensive than the alternatives. Sandbag construction is very labor intensive, but at the same time, volunteer labor is often readily available during high water.

b. Allowable seepage

Most construction methods will allow some degree of seepage through the structure. As is the case with sandbags, modifications may be made to the basic designs so that the seepage is reduced, but these modifications usually take additional time to construct.

c. Suitability for construction in the given area

Sandbags are extremely versatile and sandbag structures can be constructed almost anywhere. Sandbags can be used to close small roads or to fill gaps, or can be built into long stretches of levees if there is adequate time and manpower.

d. Equipment requirements

Sandbag structures can be built without heavy machinery, which may be required for some other options. There are a number of situations where it's not possible to use even light earthmoving machinery. For example, there might not be enough space for the machinery, or the foundations might be too unstable. Also, individual landowners may object to the use of machinery over their properties.

e. Necessary elevation

Though sandbag levees are best suited for elevations of 3 feet or less, they have successfully been used to raise elevations by 20 feet or more in extreme flooding situations.

f. Disposal

Burlap sandbags are biodegradable and relatively easy to remove and dispose of. Other options typically take much longer to remove and create more waste. Some are reusable.

2.2 Raising a Levee with Sandbags

a. Sandbags

Sandbags are available in plastic and in burlap. The preferred bags are untreated, close weave burlap sacks available at feed or hardware stores. Empty bags should be stockpiled for emergency use, and can be stored for approximately 8 years in a rodent free environment with low humidity. The bags should not be filled ahead of time, because they will deteriorate quickly. Commercial polypropylene sandbags are also effective in a flood fight, but since plastic bags are not readily biodegradable, burlap bags will allow more options for disposal if the bags are not going to be reused. (No sandbags should be left in place after the flood fight, regardless of whether they are burlap or plastic.) Garbage bags shall not be used, as they are too slick to stack; and don't use feed sacks, as they are too large to handle. Typical dimensions for sand bags are approximately 14 inches wide and 24 inches deep.

b. Fill Material

A sandy soil is most desirable for filling sandbags, as it's easiest to shovel, and the bags can most easily be shaped as needed. Fine sand tends to leak through the weave in the bag, and if it is used it should be double bagged. Silty soils also tend to leak through the bags, and both silty soils and clays are difficult to shape into place. Gravelly or rocky soils are generally poor choices for sandbag structures because of their permeability, though rocks and gravel may be used in sandbags in order to divert water flows, to fill holes, or to hold objects in position. However, any usable material at or near the site has definite advantages. Material should generally not be removed from within 500 feet of the landward toe of a levee, except for in extreme emergency situations.

c. Manual Sandbag Filling

Filling sandbags manually requires two people. One member of the team folds the throat of the bag outward to form a collar, and holds it open so that the other person can shovel in material. The one holding the bag should hold it between or slightly in front of his or her feet, either crouching with his elbows resting on his knees or standing with his knees slightly flexed, while keeping his head and face as far away from the shovel as possible. Both people should be wearing gloves to protect their hands, and safety goggles may also be desirable, especially on dry or windy days.

Figure 13.1 *This two-person team is positioned properly for sandbag filling*

Bags should be filled between one-half (1/2) to two-thirds (2/3) of their capacity. This keeps the bag from getting too heavy, but more importantly, sandbag structures do not seal or keep out water as well if the bags are more than 2/3 full. Be very careful not to overfill or under fill the bags.

d. Mechanical Sandbag Filling

For large scale operations, filling sandbags can be expedited by using one of our sandbag filling machines. The sandbagger machine (Sandbagger Model II with Motorized Auger) is an automated sandbag-filling system used to fill four (4) sandbags simultaneously. It requires four (4) people to fill sandbags and one (1) person to operate the front-end loader to keep the 2 cubic yard hopper full. This unit is capable of filling at least 1600 bags per hour using unskilled labor. This truck-portable sandbagger is equipped with a hydraulic driven auger and agitator to keep wet materials flowing.

Figure 13.2 *Sandbag filling machine*

e. Tied vs. Untied Bags

Although tied sandbags are generally easier to handle and stockpile, untied sandbags are recommended for most situations, because untied bags make a better seal when they're stacked. Since the bags aren't more than 2/3 full, they can be transported almost as easily whether they're tied or untied. Tied sandbags should be used only for special situations when the bags need to be pre-filled and stockpiled, or for specific purposes such as filling holes or for holding objects in position.

f. Preparing the Ground

Any debris must be removed from the area before the bags are laid in place. Flat headed shovels are used to scrape up ("scarp") the sod or gravel where they are to be laid, to get down to the solid ground where the bags are to be laid. Do not scarp the ground beyond the area directly under the sandbags, because the sod cover in other areas is needed to protect the ground from erosion. Before laying the bags along the entire length of an area to raise the levee, it's important that you first fill in any low areas with sandbags or with tightly packed earth, so that subsequent sandbag layers will be kept level.

g. Sandbag Placement

When laying the sandbags, the open end of the unfilled portion of the bag is folded over to form a triangle. If tied bags are used, flatten or flare the tied end. Place the partially filled bags lengthwise and parallel to the direction of flow, so the bottom of the bag faces downstream and the folded end faces upstream. (This positioning reduces the chance that floating debris will snag on the tucks and open the bags.)

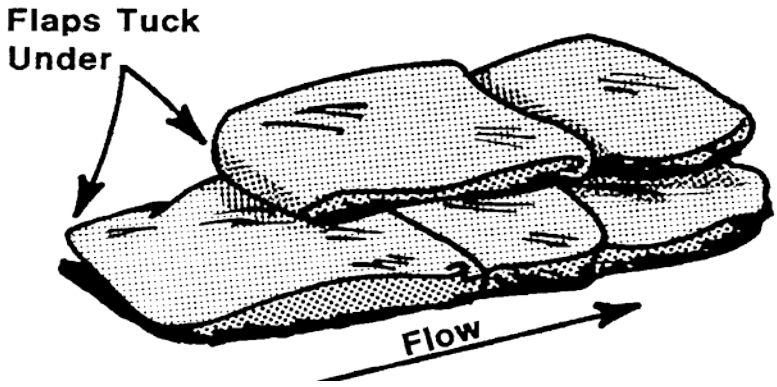


Figure 13.3 *Sandbag placement – tucking in the flaps.*

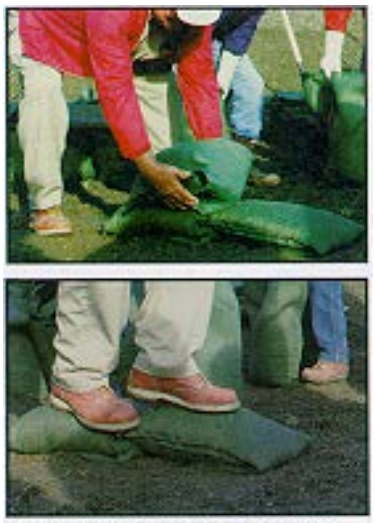


Figure 13.4 *Sandbag placement-compacting bags together.*

Tuck the flaps under, keeping the unfilled portion under the weight of the sack. Overlap the next bag slightly over the one before it, so that the top of that sandbag layer can be flattened without leaving any gaps between the bags. Once a bag is placed, it's very important that you then walk over it, stomp on it, or maul it into place to eliminate voids and form a tight seal.

When succeeding layers are added, stagger the bags like bricks, so that each one is placed over the gap between the two below it. This ensures that each seam is interlocked between bags and strengthens the structure. (There should never be less than 1/3 the length of a bag overlapping with the ones beneath it.) When placed properly, each bag should raise the elevation of the structure by 4 inches.

h. Sandbag Levees

Sandbags can be used to raise the height of an existing levee or can be used over open ground to protect an area with no levee at all. Any time a sandbag levee will be constructed over one layer high; the bag should be stacked in a pyramid structure to ensure stability. The basic rules of thumb in constructing these structures is that they must be approximately three times as wide as they are high, and the sandbags should be staggered within each layers just as they are staggered from one layer to the next. The directions of the bags (transverse or longitudinal) may be alternated, as long as no loose ends are left exposed. Use this rule of thumb in determining the dimensions of the pyramid:

- 1 bag in length equals about 1 foot
- 3 bags in width equals about 2 ½ feet
- 3 bags in height equals about 1 foot

When building these structures on top of an existing levee, the bags should begin 1 foot from the riverward crown (shoulder) of the levee. Where space is extremely limited on the levee crown, this distance may be reduced but the structure should never be built less than 6 inches from the edge of the levee crown. Stamp each bag in place, overlap sacks, maintain staggered joint placement, and tuck in any loose ends.

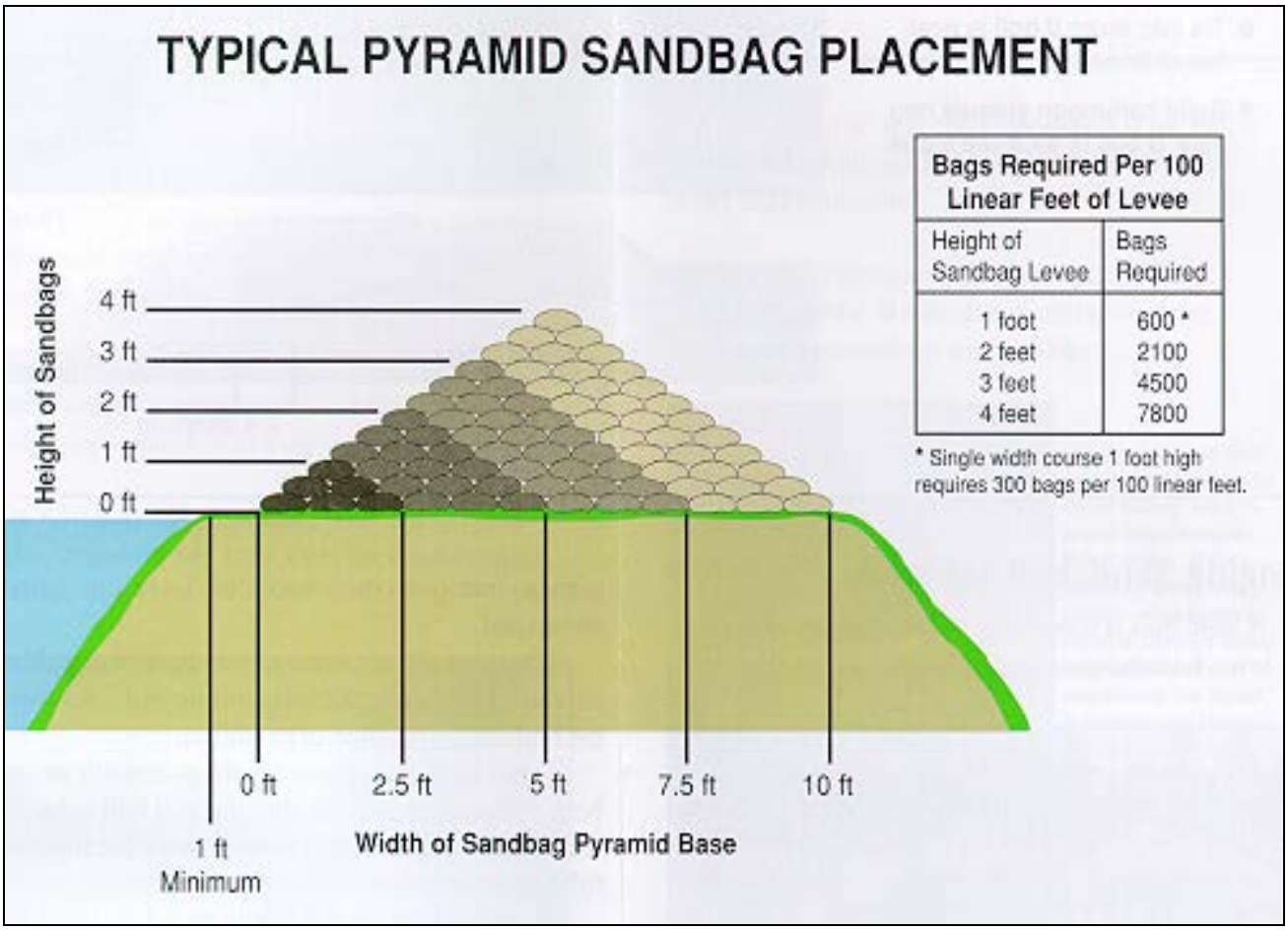


Figure 13.5 *Pyramid sandbag placement.*

i. Material, Tools, and Labor Requirements for Sandbag Levee

Listed below are the materials, tools, and labor required to construct 100 linear feet of sandbag levee, two feet high, with a haul distance of 1 mile round trip.

i. Materials and Tools

1,800 Sandbags
10 Shovels
27 Flash lights
10 Tons sand (approx)
2 Emergency light sets
2 Radios or cell phones (one at filling site; one at laying site)
6 Pickup trucks

ii. Labor Requirements:

10 Filling sandbags
5 Loading
6 Hauling
5 Laying
2 Foremen (1 at sandbag filling site, 1 at work site)
28 People required, total

iii. Time Requirements:

With given resources, the time for completion is estimated at 2 ½ hours, from start to finish.

j. Bonding Trench and Plastic Sheeting

Seepage through a sandbag structure can be kept to a minimum if the structure is built carefully using untied bags. One method that's been successfully used to reduce the seepage through a sandbag levee and to increase the horizontal stability is to construct a bonding trench under the structure before the sandbags are laid in place, as pictured below. An additional precaution is to build the structure over some plastic sheeting, which is pulled up and over the structure once it's complete.

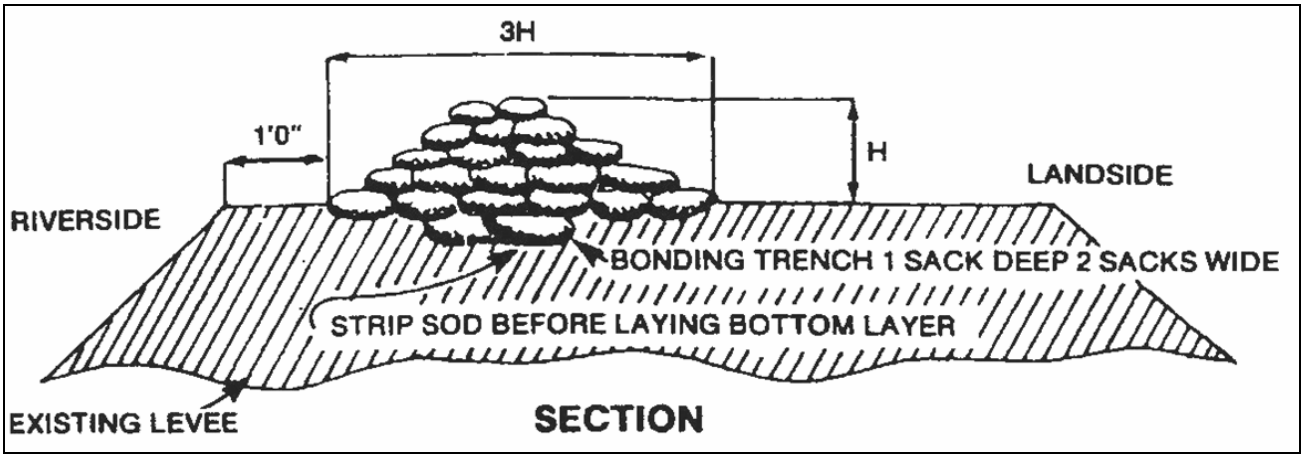


Figure 13.6 *Sketch of a typical levee raise with bonding trench.*

While it's always recommended at least to scarp the ground before the bags are laid, the decision to dig this trench or use the plastic sheeting depends on local conditions, as well as on the expected height of the structure and the time that's available to build it. One of the primary concerns when considering bonding trenches and/or plastic sheeting is the amount of time that's available. If there's sufficient time and adequate material, the seepage can be reduced, but if there is very little time available, the ground should be scarped and a typical sandbag structure constructed with no bonding trench at all. An additional concern is whether the sandbag levee would have to be raised in the future, because any plastic sheeting has to be removed before the structure can be raised.

If plastic sheeting is to be used in conjunction with the sandbag levee, begin by digging a bonding trench 2 sandbags wide and one sandbag deep. The edge of the plastic is placed in the hole and weighed down with sandbags, with most of the plastic laying out in the direction of the river. It's very important that the plastic is never laid across the entire width of the sandbag levee base. Sandbag levees are held together by frictional forces between the bags and with the ground surface; sandbag structures are much less stable when wrapped with plastic, and can slide apart under high water. Construct the sandbag levee over the sheeting, pull the plastic up and overtop of the structure and weigh it down with sandbags on the landward side. Always work from downstream to upstream so that the upstream plastic seams all overlap the ones downstream, in order to prevent debris from snagging the plastic and pulling the sandbag levee apart.

3. Seepage

As a river rises, the hydrostatic pressure against a levee slope increases significantly and can force water into and under the levee embankment. Even when a levee is properly constructed and of such mass to resist the destructive action of flood water, this seepage tends to push its way through regions of least resistance (such as sandy layers under the levee or animal burrows) out to the surface on the landward side of the structure. If there isn't sufficient pressure on the landward side to hold back the seepage water, it will break through the ground surface on the landward side, in the form of bubbling springs, which erode and carry soil particles from under the levee. Seepage is almost impossible to eliminate and attempt to do so may create a much more severe condition. Seepage is generally not a problem unless 1) the landward levee slope becomes saturated over a large area, 2) seepage water is carrying material from the levee, or 3) pumping capacity is exceeded. Pumping of seepage should be held to a minimum, and ponding should be allowed during high water to the extent that it doesn't cause damages. Several levees were endangered during past floods by attempts to keep low areas pumped dry, and additional time and effort were expended in controlling sandboils caused by pumping. Therefore, seepage should be permitted if no apparent ill-effects are observed and if adequate pumping capacity is available.

3.1 Effects of Underseepage

Underseepage can produce three distinctly different effects on a levee, depending upon the condition of flow under the levee.

a. Piping Flow

In extreme conditions of excessive underseepage, the movement of seepage water erodes the foundation materials, and a clearly defined pipe or tube develops under the levee. Unless corrective actions are taken, water continues to erode and enlarge this pipe, so that a cavern develops under the levee, and levee material collapses to fill in the void. In an advanced state, piping under the levee

can be identified by a slumping of the levee crown, and the levee can quickly fail if it's overtopped through this low spot. To prevent this condition from developing, any boils found to be transporting soil material need to be treated as early as possible.

b. Non-Piping Flow

In this case, seepage water flows under the levee without following a well-defined path, and results in one or more boils outcropping at or near the landside toe. The flow from these boils tends to undercut and ravel the landside toe, resulting in sloughing of the landward slope. Sloughing is the movement of small amounts of soils from the embankment slopes. Sloughing may also occur if the levee embankment becomes saturated as a result of prolonged high river stages. Evidence of this type of failure is found in undercutting and raveling at the landside toe.

c. Saturating Flow

In this case, numerous small boils, many of which are scarcely noticeable, outcrop at or near the landside toe. While no boil may appear dangerous in itself, a group of boils may cause significant damage. The flowing water may erode away supporting material and/or keep the area saturated and cause flotation ("quickness") of the soil, reducing the shearing strength of the material at the toe (where maximum shearing stress occurs) which could lead to slope failure. In a slope failure condition, a substantial section of the levee embankment breaks away along a clearly defined crack and slides away from the levee. The displacement of the soil will result in a reduction in the cross sectional area of the levee and poses a major threat to the integrity of the structure.

3.2 Sandboils

a. Identification of Sand Boils

Sandboils usually occur within 10 to 300 feet from the landside toe of the levee and, in some instances, have occurred up to 1,000 feet away. Boils will have an obvious exit (such as a rodent hole), but the hole may be very small. When material is carried upward through a boil, it is deposited in a circular pattern around the exit location, and is comparable to an ant hill or volcano. Alternately, sandboils may exit into standing water. In this case, they may be difficult to identify, especially if the hole is small and the water cloudy from siltation. If you see any movement in what appears to be standing water on the landward side of the structure, this may be the exit point for a sandboil. Carefully approach the site, disturbing the water as little as possible, and let the water settle in order to look for the exit point. If there is no distinct hole, the water flow is not a threat. All boils should be conspicuously marked with flagging so that patrols can locate them without difficulty and observe changes in their condition. You can tell how serious a boil is by the color of the water that is coming out. If the water is relatively clear, it means that there is relatively little material being eroded away through the boil. The site should be monitored regularly for changes, but nothing else should be done to treat the clear boil. If it's dark or muddy, then it's full of material that's been eroded away from under the levee, and must be treated immediately. Boils may quickly grow very large, and boils, which are discharging clear water, may suddenly begin to discharge soil materials along with the seepage flows. For this reason, any boil, whether the flow is clear or muddy, can potentially lead to the failure of the levee and must be monitored closely.

b. Treatment of Sandboils

The most common and accepted method of treating sandboils that are displacing soil is to construct a ring of sandbags around the boil(s) as illustrated in Plate 1. The purpose of the ring is to raise a head of water over the boil to counterbalance the upward pressure of the seepage flow. The height of the water column is adjusted so that the water exiting the boil runs clear and no longer removes soil from the levee foundation. **It's extremely important that the flow of water is never stopped completely**, as this may cause additional boils to break out nearby. Treated areas should be kept under constant surveillance until the water recedes.

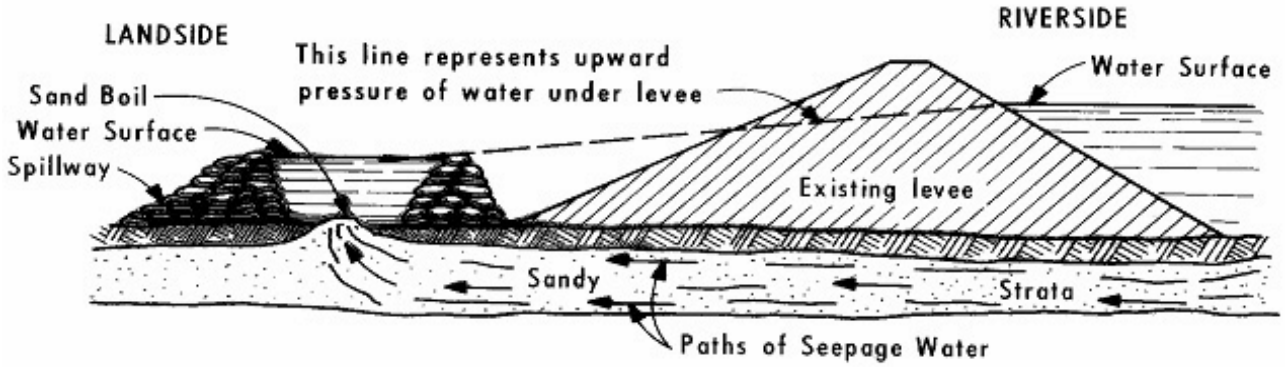


Figure 13.7 *To treat the sandboil, the pressure of the seepage water is counterbalanced by hydrostatic pressure from the column of water in the ring levee.*

The diameter and height of the ring will depend on the actual conditions at each sandboil. The base width should be at least 1½ times the contemplated height, and the inner ring of sandbags should begin between one and three feet from outer edge of the sandboil. "Weak" or "quick" ground near a boil should be included within the sack ring to prevent these areas from developing into new boils when the active boil is treated. Where several sandboils develop in a localized area, a ring levee of sandbags should be constructed around the entire area. The ring should ideally be of sufficient diameter to permit sacking operations to keep ahead of the flow of water. When a sandboil is located near the levee toe, the sandbag ring may be tied into the landside slope of the levee, as shown in Plate 2.

The base or foundation for the sack ring should be cleared of debris and scarified to provide a reasonably watertight bond between the ground surface and the sandbags. The ring is constructed with sacks filled approximately two-thirds (2/3) full of sand, and tamped firmly into place. Do not tie the ends of the sacks. When adding subsequent layers, the joints should be staggered for stability and water tightness. The untied ends of sandbags should be laid towards the inside of the ring and folded under. The height of the sack ring should be only sufficient to slow the flow until the water exiting the boil runs clean. Never place sandbags directly over the sandboil or attempt to completely stop the flow through the boils, as this may result in other boils developing nearby.

A spillway or exit channel should be constructed on the top of the sack ring so that the level of the water in the ring levee can be adjusted, and the overflow water can be carried a safe distance from the boil, away from the direction of the levee. Because the height of the water is the critical factor in adjusting the rate of flow through the boil, the spillway will require constant monitoring and adjustment once the sandbag ring levee is filled with water. This spillway is normally constructed of

sandbags, but alternately, a V-shaped drain can be constructed of two boards; or PVC pipe, plastic sheeting, or other materials may be helpful in building the spillway.

c. Material, Tools, and Labor Requirements for Sandbag Ring Levee:
Materials, tools, and labor required to construct a Sandbag Ring Levee 2½ feet high and 10 feet in diameter with a haul distance of 1 mile round trip.

i. Materials and Tools:
1,125 Sandbags
5 Shovels, long or short handle
9 Tons of sand (approximately)
5 Pick up trucks
2 Radios or cell phones (one at filling site; one at laying site)
2 Emergency light sets
15 Flashlights
15 Pairs of work gloves

ii. Labor Requirements:
4 Filling sandbags
3 Loading / carrying
5 Hauling to work site
3 Laying (placement)
2 Foremen (one at sandbag filling site; one at work site)
17 People required, total

iii. Time Requirements:
With given resources, time for construction is estimated to be 1-½ hours from start to finish.

3.3 Floating Soil Conditions

When seepage exits landward of the levee toe at a pressure that creates a sensation like the soil is fluid, the levee and foundation become susceptible to sliding and/or sloughing which can lead to an embankment failure. A fluid soil condition is an indicator that soil particles or the soil mass is floating, and the soil's ability to support a load such as a vehicle or heavy equipment and/or the levee embankment itself has been reduced. When this condition is observed, the safety, health and welfare of those individuals who are responding to the flood fight and/or those who live within the protected area must come first. Consideration must be given to evacuating the area. If the sod layer appears to pop loose or lift up, evacuate the area immediately. In a past flood, this condition was observed and successfully solved with the placement of clean, free-draining sand fill, classified as SP medium to fine sand, with less than 5 percent fines passing the number 200 sieve. The sand was brought in from another location (away from the levee), and a bulldozer was used to push the sand over the area, creating a blanket some 3 feet in thickness and some 20 feet in width. The thickness and width necessary may vary depending on the observed conditions.

4. Erosion

4.1 Wave Wash

During high water, continuing wave action against a levee slope can erode wide terraces along the length of the levee. This causes scour or beaching along the riverward slope of the levee and reduces the cross sectional area, which can potentially lead to a failure. This type of damage doesn't typically arise during short (hour-long) storms, especially if the slope has good sod cover. However, during longer periods of high water, especially during windy conditions, the damage can develop very rapidly. The section leader should study the levee beforehand to assess the potential for wave wash. All potential trouble areas should be located well in advance, and section leaders should assemble a reserve supply of materials (filled sandbags, lumber, stakes, plastic sheeting, rock, etc) close to locations most likely to experience such damage. During periods of high wind and high water, when waves attack a levee, ample labor should be assembled and experienced personnel should patrol the areas to identify the beginnings of scour, washouts, or breaching. Because wave wash damage can spread rapidly, it is important that damaged areas are treated as soon as they are identified. There are a number of accepted methods of protecting a levee against wave wash.

a. Sandbags

In emergency situations, the preferred treatment method is to place sandbags into the cut as shown in Plate 3. The filled sacks should be laid in sections of sufficient length to give protection well above the anticipated rise.

b. Plastic Sheeting and Sandbags

Experience has shown that a combination of plastic sheeting and sandbags is one of the most expedient, effective and economical methods of combating slope attack in a flood situation. Poly and sandbags can be used in a variety of combinations, and time becomes the factor that may determine which combination to use. Ideally, poly and sandbag protection should be placed in the dry. However, many cases of unexpected slope attack will occur during high water, and a method for placement in the wet is covered below. See Plates 4 and 5 for recommended methods of laying poly and sandbags. Since each flood fight project is generally unique (river, personnel available, materials, etc.), specific details of placement and materials handling will not be covered, though some guidelines are provided below. Field personnel must be aware of resources available when using poly and sandbags.

i. Dry Placement

Anchoring the poly along the riverward toe is important for a successful job. Laying poly in the dry may be done in two different ways: 1) poly placed flat-out away from the toe, and earth pushed over the flap; 2) poly placed flat-out from the toe and one or more rows of sandbags placed over the flap. The poly should then be unrolled up the slope and over the top enough to allow for anchoring with sandbags. Poly should be placed from downstream to upstream along the slopes and overlapped at least two feet. The poly is now ready for the "hold-down" sandbags. Plate 4 shows a typical section of levee covered in the dry.

It is mandatory that poly placed on levee slopes be held down along the slopes as well. An effective method of anchoring poly is a grid system of sandbags, unless extremely high velocities or heavy debris is anticipated. Then, a solid blanket of bags over the poly should be used. A grid

system can be constructed faster and requires fewer bags and much less labor than a total covering. Various grid systems include vertical rows of lapped bags or rows of bags held by a continuous rope tied to each bag. Poly has been held down by a system using two bags tied with rope and the rope saddled over the levee crown with a bag on each slope.

ii. Placement in the Wet

In many situations during high water, poly and sandbags placed in the wet must provide the emergency protection. Wet placement may also be required to replace or maintain damaged poly or poly displaced by current action. Plate 5 shows a typical section of levee covered in the wet. Sandbag anchors are formed at the bottom edge and ends of the poly by bunching the poly around a fistful of sand or rock, and tying the sandbags to this fist-sized ball. Counterweights consisting of two or more sandbags connected by a length of 1/4-inch rope are used to hold the center portion of the poly down. The number of counterweights will depend on the uniformity of the levee slope and current velocity. Placement of the poly consists of first casting out the poly sheet with the bottom weights and then adding counterweights to slowly sink the poly sheet into place. The poly, in most cases, will continue to move down slope until the bottom edge reaches the toe of the slope. Sufficient counterweights should be added to insure that no air voids exist between the poly and the levee face and to keep the poly from flapping or being carried away in the current. For this reason, it is important to have enough counterweights prepared prior to the placement of the sheet.

iii. Overuse of Plastic Sheeting

In past floods, there has been a tendency to overuse and in some cases misuse poly on slopes. For example, on well-compacted clay embankments, in areas of relatively low velocities, use of poly would be excessive. Plastic should never be used on the landward slopes, as it holds through-seepage against the levee slope. A critical analysis of a situation should be made before poly and sandbags are used, with a view toward less waste and more efficient use of these materials and available manpower. However, if a situation is doubtful, poly should be used rather than risk a failure. Critical areas should have priority.

4.2 Scours

Scouring occurs when the current velocity against the levee is adequate to remove levee embankment materials. Once scouring begins to occur, the protective sod cover is damaged or destroyed and additional scour may develop very quickly. Careful observation should be made along the entire length of the riverside of the levee during high water periods, and especially in locations where the current flow is two feet per second or more. Scouring will most likely develop at road crossing ramps and at locations where pipes, sewers, and other structures penetrate the levee. It may also develop in ditches, excavations or building basements near the levee, around riverside stability berms, or in other locations where there is an obstruction to the smooth flow of water along the levee face. If any scour is observed, soundings should be taken if possible to determine the extent of damage and the amount of treatment required.

a. Plastic Sheeting

Plastic sheeting is useful in protecting the embankment from scouring, as described under the previous section on wave wash.

b. Other Protection

If scour begins to take place after water is up on the levee, a protective berm should be constructed over the entire scour area using stone, slag, or other durable material with sufficient size and eight withstand the erosive velocity of the current. Construction of this berm will generally require equipment capable of operating from the levee crown. Riprap has been used to provide slope protection where erosive forces were too large to be effectively controlled by other means. Objections to using riprap when flood fighting include the cost and the large quantities that are typically necessary to protect a given area. It's usually very difficult to control the placement of the riprap, particularly during times of high water, but careful use of an excavator has been effective even in difficult conditions.

Figure 13.8 *Placement of rock riprap. Careful use of an excavator may allow for more accurate placement than is shown above.*

EXHIBIT 14
FLOOD PATROL SECTORS

GENERAL INSTRUCTIONS FOR PATROLPERSONS, FLOOD PATROL AND FLOOD FIGHTING

(1) Each person involved must realize and know the extreme importance and responsibility of his part and position in the flood fighting organization.

(2) Each person on patrol as well as others should be alerted and instructed to observe, record, and report:

- (a) Progressive flood stages.
- (b) Boils and seeps on the landside of levees and dikes.
- (c) Slope and crown erosion from waves and currents.
- (d) Structures' condition and proper operation of same.
- (e) Pumping across levee into floodway - watch for levee erosion and pipes should be covered to permit traffic over them.
- (f) Watch levee freeboard - report any condition that is less than 4' measured vertically.

(3) Observe at all times the safety rules and safety program.

(4) Assure that equipment is at all times serviced, fueled and ready to go at a moment’s notice. It will be Management’s responsibility to see that equipment is strategically placed.

(5) Personnel to be instructed in use of communications and impressed with vital importance of immediate reporting of any unusual sightings or condition, however seemingly unimportant.

(6) Each patrolperson shall not leave his post or assigned patrol sector until relieved or unless instructed otherwise.

- (a) Each patrol unit will be furnished a log book. All gage readings, problems, emergency situations, etc., should be recorded, together with time and date. Each patrolman should sign the log book at the end of his shift.

EXHIBIT 14 (Cont.)
FLOOD PATROL SECTORS

(b) Upon being relieved, he will pass on to his relief the log book, the present situation prevailing in his particular sector, any particular work or instructions that are to be carried out during the succeeding shift, as well as information of happenings and the prevailing conditions during the shift just passed.

(c) Each patrolperson shall be expected and prepared to ”double shift” if an emergency should require same.

(7) Patrol areas and special instructions regarding Patrol Sectors are listed below.

Patrol Sector No. 1 Percha Diversion Dam to Leasburg Diversion Dam

Patrol Sector No. 2 Leasburg Diversion Dam to Mesilla Diversion Dam

Patrol Sector No. 3 Mesilla Diversion Dam to Anthony Bridge

Patrol Sector No. 4 Anthony Bridge to American Diversion Dam

Patrol Sector No. 5 American Diversion Dam to Fabens-Guadalupe Bridge

Patrol Sector No. 6 Fabens-Guadalupe Bridge to Fort Hancock Bridge

Patrol Sector No. 7 Fort Hancock Bridge to Fort Quitman

EXHIBIT 15
RIVER MILEAGES

Location	Miles Above American Dam	Miles From Preceding Location	Miles Below Elephant Butte
Elephant Butte	135.1	-----	0
Caballo Dam	107.6	27.5	27.5
Percha Dam	105.6	2.0	29.5
Arrey Bridge	103.4	2.2	30.7
Garfield Bridge/U.S. 85	100.3	3.1	34.8
Sierra/Dona Ana County Line	97.9	2.4	37.2
Hatch Siphon	90.1	7.8	45.0
Salem Bridge	88.0	2.1	47.1
Hatch Bridge/U.S 85	86.3	1.7	48.8
Hatch Bridge/SH 26	84.2	2.1	50.9
Santa Fe Railway	81.91	2.29	53.19
Rincon-Hatch Bridge	81.9	0.01	53.2
New Rincon Bridge	78.8	3.1	56.3
Hayner (Toñuco) Bridge	73.8	5.0	61.3
Leasburg Dam	62.0	11.8	73.1
New Leasburg Bridge	61.25	0.75	73.85
Old Leasburg Bridge	61.2	0.05	73.9
Shalem Bridge	51.2	10.0	83.9
Picacho Bridge	45.7	5.5	89.4
I-10 Bridge	44.3	1.4	90.8
Mesilla Bridge	42.4	1.9	92.7
Santo Tomas Bridge	36.6	2.7	98.5
Mesquite Bridge	32.6	4.0	102.5
Vado Bridge	27.9	4.7	107.2
Berino Bridge	24.21	3.69	110.89
Old Anthony Bridge	21.11	3.1	113.99
New Anthony Bridge	19.31	1.8	115.79
Vinton Bridge	15.76	3.55	119.34
Canutillo Bridge	12.71	3.05	122.39
Borderland Bridge	10.68	2.03	124.42
Artcraft Bridge	10.15	0.53	124.95
Country Club Bridge	7.86	2.29	127.24
Sunland Park Bridge	3.19	4.67	131.91
Anapra (Racetrack) Bridge	2.68	0.51	132.42
Courchesne Bridge	1.67	1.01	133.43
Union Pacific Railway Bridge	0.32	1.35	134.78
Union Pacific Railway Bridge	0.22	0.1	134.88
Brick Plant Bridge	0.20	0.02	134.90
American Dam	0	0.20	135.10

EXHIBIT 15 (Cont.)
RIVER MILEAGES

Location	Miles Below American Dam	Miles From Preceding Location	Miles Below Elephant Butte
International Dam	2.1	2.10	137.20
Begin Chamizal	3.53	1.43	138.63
Begin Rectification	7.88	4.35	142.98
Ysleta-Zaragoza Int'l Bridge	16.22	8.34	151.32
Riverside Heading	17.29	1.07	152.39
Island Gaging Station	27.66	10.37	162.76
Island Grade Control	33.04	5.38	168.14
Fabens-Guadalupe Int'l Bridge	37.57	4.53	172.67
Tornillo Grade Control	40.68	3.11	175.76
County Line Gage	47.86	7.18	182.96
Alamo Grade Control	53.91	6.05	189.01
Alamo Arroyo	55.88	1.97	190.98
Ft. Hancock-Porvenir Int'l Brdg	60.40	4.52	195.50
Diablo Arroyo	63.70	3.32	198.82
Guayuco Grade Control	75.40	11.68	210.50
Ft. Quitman Gaging Station	81.66	4.57	216.76
Lower End Rectification	90.88	9.22	225.98
Ft. Quitman Canyon	91.87	0.99	226.97

EXHIBIT 16
TRAVEL TIME OF FLOOD FLOWS

Leasburg Dam to End of Project River Reaches	4,000 cfs		7,000 cfs		10,000 cfs	
	mph	hrs	mph	hrs	mph	hrs
Leasburg Dam to American Dam 62 miles	4.22	15	4.15	15	2.88	22
Mesilla Dam to American Dam 39 miles	4.22	9	4.15	9	2.69	14
Canutillo Bridge to American Dam 13 miles	4.22	3	4.15	3	2.63	5
Country Club Bridge to American Dam 7.9 miles	4.22	2	4.15	2	2.63	3
American Dam to Riverside 16.8 miles	3.65	5	2.85	6	2.30	7
American Dam to Tornillo Grade Control 40.2 miles	3.32	12	2.86	14	2.23	18
American Dam to End of Project 91.3 miles	3.31	28	2.86	32	2.02	45

These travel times do not reflect the timing of a steady flow but are the average for floods which reach the El Paso Station with peaks of 4,000 cfs, 7,000 cfs, and 10,000 cfs.

EXHIBIT 17
LEVEE ELEVATIONS AT SELECTED LOCATIONS

1) Hatch Bridge
Datum: Rincon (USGS- 43.15 feet = Rincon)
Design Flood 20,000 cfs

Elevation	
4021.8	Top of levee
4020.8	Design Flood
4018.0	Oct 1958 (13,400 cfs)
4016.0	Top of bank (5,000 cfs)
4009.7	Bottom of channel

2) Hayners (Tonuco) Bridge
Location: On gage well downstream side of bridge
Datum: Rincon (USGS- 43.15 feet = Rincon)
Design Flood 21,000 cfs
Staff Gage

Elevation	
3971.8	Top of levee
3969.8	Design Flood
3969.0	Oct 1958 (12,900 cfs)
3958.0	Zero gage
3952.9	Bottom of channel

3) Leasburg Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 17,000 cfs
No levee

Elevation	
3922.8	Top of Overbank
3917.7	Oct 1958 (13,100 cfs)
3914.0	Top of Riverbank (6,550 cfs)
3905.2	Bottom of channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

4) Shalem Bridge
Location: Gage well on east end of bridge
Datum: Mesilla (USGS - 41.3 feet = Mesilla)
Design Flood 16,000 cfs
Staff Gage

Elevation	
3880.9	Top of Levee
3875.3	Design Flood
3874.7	Oct 1958 (12,000 cfs)
3874.4	Top of Riverbank (10,000 cfs)
3869.0	Zero gage
3865.3	Bottom of channel

5) Pichacho Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 15,500 cfs

Elevation	
3857.0	Top of Levee
3852.8	Design Flood
3851.7	Oct 1958 (12,000 cfs)
3844.5	Bottom of channel

6) Mesilla Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 15,200 cfs

Elevation	
3844.1	Top of Levee
3841.2	Design Flood
3839.6	Oct 1958 (F.W.M)
3873.0	Top of Riverbank
3830.7	Bottom of channel

7) Santo Tomas Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 14,600 cfs

Elevation	
3819.0	Top of Levee
3814.9	Design Flood
3814.4	Oct 1958 (12,000 cfs)
3813.5	Top of Riverbank (9,400 cfs)
3806.3	Bottom of channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

8) Mesquite Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 14,000 cfs

Elevation	
3804.0	Top of Levee
3797.0	Top of Riverbank (12,500 cfs)
3794.0	July 1961 (6,082 cfs)
3788.3	Bottom of channel

9) Vado Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 13,000 cfs

Elevation	
3783.2	Top of Levee
3778.4	Design Flood
3777.0	Top of Riverbank (11,500 cfs)
3776.5	Oct 1958 (12,000 cfs)
3774.85	July 1961, 5000 cfs
3769.6	Bottom of channel

10) Berino Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs

Elevation	
3769.7	Top of Levee
3764.0	Top of Riverbank (F.W.M. Oct 1958)
3763.5	Design Flood
3754.3	Bottom of channel

11) Anthony Country Club Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs

Elevation	
3759.4	Top of Levee
3751.5	Oct. 1958 (12,500 cfs)
3751.1	Design Flood
3749.0	Top of Riverbank (5,600 cfs)
3732.2	Bottom of channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

12) Vinton Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs

Elevation	
3737.8	Top of Levee
3734.5	Design Flood
3734.1	Oct 1958 (12,300 cfs)
3728.5	Top of Riverbank (3,600 cfs)
3720.0	Bottom of channel

13) Canutillo Bridge
Location: Upstream piling of first bent in channel - west end
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs
Staff Gage, Radio Transmitter, Recorder

Elevation	
3724.8	Top of Levee
3724.6	Design Flood
3724.4	F.W.M. September 1958
3720.2	Top of Riverbank (3,000 cfs)
3715.0	Zero Gage
3713.3	Bottom of channel

14) Borderland Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs

Elevation	
3721.3	Top of Levee
3718.3	Design Flood
3715.9	F.W.M. September 1958
3714.0	Top of Riverbank
3705.7	Bottom of channel

15) Country Club Bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs

Elevation	
3711.7	Top of Levee
3709.0	Design Flood
3708.7	Sept 1958 (11,600 cfs)
3706.0	Top of Riverbank
3699.3	Bottom of channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

16) Courchesne Bridge (El Paso Gaging Station)
Location: Gage well, east end of bridge
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs
Staff Gage

Elevation	
3694.18	Top of Levee
3691.38	Design Flood
3690.78	Oct 1958 (11,600 cfs)
3686.98	Top of Riverbank (4,000 cfs)
3680.98	Zero Gage
3680.8	Bottom of channel

17) American Dam
Location: 25 feet upstream of Gate #1, bolted to wall
Datum: Mesilla (USGS- 41.3 feet = Mesilla)
Design Flood 12,000 cfs
Staff Gage

Elevation	
3679.52	Top of Levee
3678.22	Design Flood
3671.0	Zero Gage

18) Below American Dam
Location: On recorder at Gaging Station
Datum: IBWC (USGS- 1.26 feet = IBWC)
Design Flood 12,000 cfs
Staff Gage, Telemetry Transmitter, Recorder, Staff Gage

Elevation	
3686.52	Top of Levee
3686.42	Design Flood
3678.82	Top of Riverbank (2,500 cfs)
3771.0	Zero Gage
3769.6	Bottom of channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

19) International Dam
Location: Upstream side of recorder on dam
Datum: IBWC (USGS- 1.26 feet = IBWC)
Design Flood 12,000 cfs
Staff Gage, Telemetry Transmitter, Recorder, Staff Gage

Elevation, m	Elevation, ft	
1135.748	3726.21	Top of Levee
1135.06	3723.95	Design Flood
1131.179	3713.22	Oct 1958 (11,300 cfs)
1149.400	3771.00	Zero Gage

20) Ysleta-Zaragosa Bridge
Location: Upstream piling on first bent in channel, US side
Datum: IBWC (USGS-1.26 feet (0.384m) = IBWC)
Design Flood 13,100 cfs
Staff Gage (records in feet)

Elevation, m	Elevation, ft	
1120.103	3674.88	Top of Levee (100 ft upstream of Bridge)
1118.900	3670.93	Design Flood
1118.468	3669.51	Oct 1958 (9,800 cfs)
1117.581	3666.61	Top of Riverbank
1115.966	3661.31	Zero Gage
1115.870	3660.99	Bottom of channel

21) Island Gaging Station (near Clint, TX) - REMOVED
Datum: IBWC (USGS- 1.26 feet (0.384m) = IBWC)
Design Flood 11,000 cfs

Elevation, m	Elevation, ft	
1106.829	3631.33	Top of Levee
1105.549	3627.13	Design Flood
1104.330	3623.13	Oct 1958(7,000 cfs)
1104.115	3622.43	Top of Riverbank(5,600 cfs)
1101.700	3614.50	Bottom of Low Flow Channel

EXHIBIT 17 (Cont.)
LEVEE ELEVATIONS AT SELECTED LOCATIONS

22) Fabens-Guadalupe Bridge (near Tornillo, TX)
Datum: IBWC (USGS- 1.26 feet(0.384m) = IBWC)
Design Flood 11,000 cfs

Elevation, m	Elevation, ft	
1096.252	3596.63	Top of Levee
1094.083	3592.03	Design Flood
1093.143	3586.43	Top of Riverbank (2,600 cfs)
1091.500	3581.04	Bottom of Low Flow Channel

23) County Line Gaging Station near Acala, TX - REMOVED
Datum: IBWC (USGS- 1.26 feet (0.384m) = IBWC)
Design Flood 11,000 cfs

Elevation, m	Elevation, ft	
1085.109	3560.07	Top of Levee
1083.890	3556.07	Design Flood
1083.448	3554.62	Oct 1958 (6,350 cfs)
1083.128	3553.57	Top of Riverbank
1081.020	3546.65	Bottom of Low Flow Channel

24) Fort Hancock Bridge (Fort Hancock, TX)
Datum: IBWC (USGS- 1.26 feet (0.384m) = IBWC)
Design Flood 11,000 cfs

Elevation, m	Elevation, ft	
1074.337	3524.73	Top of Levee
1073.270	3521.23	Design Flood
1072.082	3517.33	Top of Riverbank
1070.060	3610.70	Bottom of Low Flow Channel

25) Fort Quitman Gaging Station
Location: Downstream side of gaging well
Datum: IBWC (USGS- 1.26 feet (0.384m) = IBWC)
Design Flood 11,000 cfs
Staff Gage (records in feet), radio transmitter, recorder

Elevation, m	Elevation, ft	
1055.740	3463.71	Top of Levee
1055.708	3463.61	Design Flood
1055.120	3461.68	Oct 1958 (8,500 cfs)
1054.702	3460.68	F.W.S. October 1960 (6,440 cfs)
1054.550	3459.81	Top of Riverbank
1052.220	3452.16	Bottom of Low Flow Channel
1051.242	3449.31	Zero Staff Gage

EXHIBIT 18
RESPONSIBILITIES OF OTHER ENTITIES

Since 1996, the Elephant Butte Irrigation District (**"EBID" www.ebid-nm.org/wris2008/ShowRiverGroup.asp**) operates the New Mexico metering stations (river gaging stations, canals, laterals, drains, and wasteways), with the following exceptions:

Rio Grande below Caballo, which is operated and maintained by the U.S. Bureau of Reclamation **(www.usbr.gov/uc/elpaso)**

Rio Grande below Elephant Butte, which is operated and maintained by the USGS**(http://waterdata.usgs.gov/NM/nwis, Station No. 08361000 - "Rio Grande Below Elephant Dam, NM").**

The El Paso County Water Improvement District No. 1 operates and maintains the Texas metering stations, except for those operated and maintained by the IBWC.

The metering stations described below are used by this project for water measurement and accounting. Telemetry information can be obtained from the responsible agencies by phone or on the Internet (see **Exhibit 21 "Telephone Listing of Federal, State, and Local Authorities"**).

Rio Grande Project Metering Stations

Station	Metered By:
Rio below Caballo Dam	US Bureau of Reclamation (USBR)/Elephant Butte Irrigation District (EBID)
Arrey Canal	EBID
Garfield Drain	EBID
Hatch Drain	EBID
Rincon Drain	EBID
Rio @ Hayner Bridge	EBID
Leasburg Canal Heading	EBID
Leasburg Canal (below 1st check)	EBID
Rio @ Leasburg Cable	EBID
Rio @ Picacho Bridge	EBID
Picacho Drain	EBID
Eastside Canal	EBID
Del Rio Lateral	EBID
Westside Canal	EBID
Rio below Mesilla Dam	El Paso County Water Improvement District No. 1 (EPCWID1)
Del Rio Drain	EBID
La Mesa Drain	EPCWID1

EXHIBIT 18 (Cont.)
RESPONSIBILITIES OF OTHER ENTITIES

Station	Metered By:
EPCWID1	
LUE Heading	EPCWID1
WW #32	EPCWID1
Three Saints Lateral	EBID
WW #23A	EPCWID1
Rio @ Anthony Bridge	EBID
East Drain	EPCWID1
WW #32B	EPCWID1
Rio @ Canutillo Bridge	EPCWID1
WW #34	EPCWID1
WW #35	EPCWID1
WW #36	EPCWID1
WW #38	EPCWID1
Montoya Drain	EPCWID1
Courchesne Bridge	IBWC
Rio below American Dam	IBWC
Acequia Madre (Mexico)	IBWC
Rio below International Dam	IBWC
Beeper @ American Canal	IBWC & EPCWID1
Franklin Canal	EPCWID1
Ascarate Wasteway	EPCWID1
Rio Grande above Riverside Heading	EPCWID1
Riverside Canal	EPCWID1
J. Rogers W.T.P.	EPCWID1
Riverside below WW #1	EPCWID1
Franklin Feeder	EPCWID1
Mesa Drain	EPCWID1
River Drain	EPCWID1
Fabens Waste Drain	EPCWID1
Fabens Waste Canal	EPCWID1
Tornillo Canal	EPCWID1
Hudspeth Feeder	EPCWID1
Tornillo Drain	EPCWID1
Tornillo WW #2 @ Alamo Alto	EPCWID1
Fort Quitman	IBWC

EXHIBIT 19
BRIDGES/STRUCTURES ON THE RIO GRANDE
between Caballo Dam, New Mexico and American Dam, El Paso, TX

Bridge/Structure Name	Ownership
Caballo Dam	US
Percha Dam	EBID
Arrey Bridge	Sierra County
Garfield Flume	EBID
I-85/Garfield Bridge	NM
Hatch Siphon	EBID
Route 391/Salem Bridge	Dona Ana County
Hatch Bridge	NM
Route 26/I-25 Access Bridge	NM
AT & SF Bridge	AT&SF RR
Route 140/Rincon-Hatch Bridge	NM
Rincon Siphon	EBID/USBR
Route 140/Rincon Bridge	NM
Hayner/Tonuco Bridge	EBID
Leasburg Dam	EBID/USBR
I-85/Leasburg Bridge	NM
Shalem Bridge(Shalem Colony Trail)	Dona Ana County
Pichacho Bridge	NM
I-10 Bridge	NM
Mesilla Bridge (Calle Del Norte)	NM
Mesilla Dam	EBID/USBR
Route 28/Santo Tomas Bridge	NM
Route 228/Mesquite Bridge	NM
Route 227/Vado Bridge	NM
Route 226/Berino Bridge	NM
Route 404/Anthony Country Club Bridge	NM
Route 225/New Anthony Bridge	NM
Vinton Bridge	TX
Canutillo Bridge	TX
Borderland Bridge	El Paso County
Artcraft Bridge	TX
Country Club Bridge	El Paso County
Sunland Park Bridge	NM
Anapra (Racetrack Dr.) Bridge	NM
Courchesne Bridge	El Paso County
Union Pacific Railway Bridge	Union Pacific Railroad
Union Pacific Railway Bridge	Union Pacific Railroad
Brick Plant Bridge	American Eagle Brick Company

EXHIBIT 20

5 U.S.C. 552(B)(7)(E) AND (F)

Continuity of Operations Plan

United States International Boundary and Water Commission

Mercedes Field Office

325 Golf Course Road

Mercedes, TX 78570

Under Revision

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission (IBWC) Mercedes Field Office's mission is to provide bi-national solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the Rio Grande Valley region. The Mercedes Field Office Continuity of Operations Plan (COOP) will be activated in an event of an emergency where operations are impossible at the Mercedes Field Office due to situations that prevent a healthy working environment. Elements of the COOP include field office essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising planned maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission (IBWC), Mercedes Field Office has several mandated functions per executive orders, treaties, and other bi-national agreements. Therefore, it is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for Mercedes Field Office leadership in the event that staff and assets must be relocated.

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements, mandates, that all federal agencies possess, maintain and exercise their Continuity of Operations Plan. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by an adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the headquarters building for the IBWC, Mercedes Field Office, Mercedes, Texas. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the IBWC Mercedes Field Office.

III. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Mercedes Field Office element of the IBWC, as directed by the headquarters element of the IBWC, U.S. Section, this COOP has been created and is to be maintained in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. As directed, we have maintained the same format as the Headquarters COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes successful performance of the agency mission at the primary operating location. For this COOP, it is the IBWC, U.S. Section headquarters building in El Paso, Texas.

IV. ESSENTIAL FUNCTIONS

The IBWC Mercedes Field Office mission is to provide bi-national solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Bi-national Treaties
3	Flood Control
4	Water Conservation
5	Water Quality Management to include Wastewater Treatment

V. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VI. CONCEPT OF OPERATIONS

In the event of crisis, the IBWC Mercedes Field Office will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Operations Manager of the Mercedes Field Office will decide as to whether or not to activate the COOP. If the Operations Manager is unavailable, the senior ranking official at the Mercedes Field Office will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the Mercedes Field Office headquarters building.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the Field Office Operations Manager will notify the Field Office Staff (Assistant Operations Manager, the staff Engineer, the Heavy Equipment Supervisor and the Maintenance Supervisor) about the situation. The Field Office Staff will be responsible for notifying their respective personnel. The Field Office Staff will notify their personnel as appropriate about the situation. Employees that have been identified as

emergency essential will report to secondary operating locations identified as being Anzalduas Dam and Retamal Dam; the Anzalduas Dam facility being the primary operating location. The Field Office Staff will decide where to station their essential personnel based on the situation. If the Anzalduas Dam location is unavailable due to similar problems at the facility, the tertiary location, Retamal Dam, will be used as the new operating location until reconstitution efforts come to fruition.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Operations Manager will be succeeded by the following staff in the order listed.

Successors
Assistant Operations Manager
Staff / Office Engineer
Construction Control Inspector / Safety Coordinator

b. Delegations of Authority

In the event that the Operation Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the Operations Manager shall serve as Acting Operations Manager subject to the following conditions.

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.
2. All personnel actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.

c. Devolution

In the event that the headquarters building is destroyed and all aforementioned personnel on the order of succession list are killed, the Chief, Operations & Maintenance Division will assume authority for the Mercedes Field Office. The temporary headquarters facility will be located at Anzalduas Dam followed by Retamal Dam if the Anzalduas Dam office is in a state of disrepair. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Anzalduas Dam or Retamal Dam operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
Water Accounting Systems	Mercedes Field Office, TX (Primary and backup)	Anzalduas Dam (ghost system)
GroupWise E-mail	El Paso, TX	Las Cruces, NM (backup)
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section, Mercedes Field Office.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Agency Vital Records (Directives, Treaties, Minutes, FAO Letter Log, Legal Documents, etc., located on the I-Drive)	Electronic and Hardcopy	X (accessible via network)	X	NA
Licenses, ROW and As-Built Maps	Hardcopy		X	NA
Survey Books	Hardcopy		X	NA
Water Accounting	Hardcopy and Electronic	X (accessible via network)		NA

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	NA
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)		NA

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Operations Manager or successor will make the determination as to whether it is possible to return to the primary work location, the IBWC, Mercedes Field Office headquarters building. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the Mercedes Field Office has returned to normal operations, field office Staff will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, Mercedes Field Office.

Responsibility	Position
Update COOP annually	Staff/Office Engineer
Update telephone rosters quarterly	Staff/Office Engineer
Review status of vital files, records, and databases	Assistant Area Operations Manager
Conduct alert and notification tests	Area Operations Manager
Develop and Lead COOP training	Staff/Office Engineer
Plan COOP exercises	Operations Manager, Assistant Operations Manager and Staff/Office Engineer

VIII. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the Anzalduas Dam Field Office conference room. The Anzalduas Dam location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software. In the event that Anzalduas Dam is also inoperable, the tertiary operating location will be Retamal Dam where the same basic capabilities will be necessary.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with IBWC's essential functions: ability to communicate with essential personnel, ability to communicate with other agencies, access to data and systems, ability to support COOP operational requirements, and interoperability with other field offices and projects.

IX. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal

agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

X. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The IBWC Mercedes Field Office will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC Mercedes Field Office will conduct its first telephonic recall exercise in May 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The Mercedes Field Office Area Operations Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented.

XI. COOP PLAN MAINTENANCE

COOP will be maintained by Mercedes Field Office Safety Coordinator. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission
Upper Rio Grande Field Office
2616 W. Paisano Dr.
El Paso, TX 79922

Under Revision

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the Upper Rio Grande Field Offices (URGFO) due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for agency leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating locations; in this case, are the American Dam, Las Cruces and Zac Domiguez field offices located at El Paso TX, Las Cruces NM and Fort Hancock TX respectively. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the IBWC, URGFO.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the URGFO element of the IBWC, U.S. Section. Headquarters, other field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. Headquarters, other field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of

terrorism, and any other scenario that precludes successful performance of the agency mission at the primary operating location, for this COOP, it is the American Dam, Las Cruces and Zac Dominguez field offices located as mentioned above.

V. ESSENTIAL FUNCTIONS

The IBWC mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The particular essential functions of the URGFO are as listed below:

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Binational Treaties
3	Flood Control
4	Water Conservation
5	Water Quality Management

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the IBWC, U.S. Section will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

Decision Process

The Area Operation Manager (AOM) will decide as to whether or not to activate the COOP. If the AOM is unavailable, the Assistant AOM of the URGFO will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at any one of the field office facilities mentioned above.

Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the URGFO AOM will notify his Supervisory Staff about the situation and the Supervisory Staff will be responsible for notifying their respective personnel about the situation. Employees that have been identified as emergency essential will report to secondary operating locations, which are as follows:

Field Office	Secondary Operation Location
American Dam Field Office	Las Cruces Field Office
Las Cruces Field Office	American Dam Field Office
Zac Dominguez Field Office	American Dam Field Office

The AOM will decide where to station their essential personnel based on the situation. If any or all of the secondary locations are unavailable due to similar problems at the facility, the tertiary location, the Headquarters Building, will be used as the new operating location until reconstitution efforts come to fruition.

Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Area Operations Manager will be succeeded by the following personnel in the listed order:

Successors
Assistant Area Operation Manager
Field Office Supervisor

b. Delegations of Authority

In the event that the AOM is absent for a period of more than one (1) workday, and in order to provide continuity of essential function, successors of the AOM shall be the Assistant AOM and is subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Chief Operations and Maintenance.

2. All personnel actions shall be subject to prior consultation with the Chief Operations and Maintenance.

c. Devolution

In the event that the American Dam Field Office is destroyed and all aforementioned personnel on the order of succession list are killed, the Chief of Operations and Maintenance will assume authority for the URGFO. The temporary URGFO will be located at Las Cruces Field Office followed by Headquarters if the Las Cruces Field Office is in a state of disrepair. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Las Cruces or Headquarters operating location, the following systems, databases, files, and records will be necessary for continued operations.

Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
GroupWise E-mail	El Paso, TX	Las Cruces, NM (backup)
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	
Property Database for Real Property	Electronic and Hardcopy	X (accessible via network)	X	
Water Accounting	Electronic	X (accessible via network)	X	

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)	X	

C. HEAVY EQUIPMENT

All heavy equipment that is stored and maintained at the various field office shall also be transported to the alternate facility. Priority of which equipment shall be moved shall be determined by the AOM according to the need created by the disaster.

D. PHASE III: RECONSTITUTION

Once the crisis has subsided, the AOM or successor will make the determination as to whether it is possible for the personnel to return to their respective field offices. In the event that the field offices are in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, the AOM in conjunction with agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section

Responsibility	Position
Update COOP annually	Area Operations Manager
Update field office telephone rosters quarterly	Area Operations Manager
Review status of vital files, records, and databases	Area Operations Manager
Conduct alert and notification tests	Emergency Manager
Develop and Lead COOP training	Emergency Manager
Plan COOP exercises	Emergency Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be as designated in the table under the Alert, Notification, and Implementation Process. These locations must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software. In the event that Las Cruces Field Office is also inoperable, the tertiary operating location will be the Headquarters Building where the same basic capabilities will be necessary.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and

exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The URGFO element will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC, U.S. Section, headquarters element will conduct its first telephonic recall exercise in April 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The agency Emergency Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented. The Emergency Manager will also ensure that field offices have developed COOPs for their respective operations and that exercising is conducted on the same schedule as headquarters; every six months for telephonic recall and every year for functional and full-scale implementation.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the AOM. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission

Amistad Field Office

670 Texas Spur 349

Del Rio, Texas 78840

Under Revision

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I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the Amistad Field Division due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for Amistad Field Office leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the headquarters building for the IBWC, U.S. Section Amistad Field Division located in Del Rio, Texas. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the Amistad Field Division IBWC, U.S. Section.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Amistad Field Office IBWC, U.S. Section. Every field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. All field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes

successful performance of the agency mission at the primary operating location, for this COOP, it is the Amistad Field Division, IBWC, U.S. Section in Del Rio, Texas.

V. ESSENTIAL FUNCTIONS

The IBWC mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Binational Treaties
3	Flood Control
4	Water Conservation
5	Water Quality Management to include Wastewater Treatment
6	Generation of Hydroelectric Power

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the Amistad Field Division, IBWC, U.S. Section will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Area Operations Manager, Amistad Field Division will decide as to whether or not to activate the COOP. If the Area Operations Manager is unavailable, the senior ranking official at the Amistad Field Division, U.S. Section headquarters will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the IBWC, U.S. Section Amistad Field Division headquarters building.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the Area Operations Manager or Acting Area Operations Manager will notify the USIBWC Emergency Manager who will notify the Executive Staff about the situation. The Executive Staff will be responsible for notifying their respective Division Managers. The Division Managers will notify their staff as appropriate about the situation. Employees that have been identified as emergency essential will report to secondary operating location, Falcon Dam being the primary operating location. The Amistad Supervisors will decide where to station their essential personnel based on the situation. If the Falcon Dam location is unavailable due to similar problems at the facility, the Presidio Office will be used as the new operating location until reconstitution efforts come to fruition.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Amistad Area Operations Manager will be succeeded by the following personnel in the listed order:

Successors
Assistant Area Operations Manager
Powerplant Superintendent
Operations and Maintenance Supervisor

b. Delegations of Authority

In the event that the Area Operations Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the Area Operations Manager shall serve as Acting Area Operations Manager subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the O & M Division Engineer.
2. All personnel actions shall be subject to prior consultation with the O&M Division Engineer

c. Devolution

In the event that the headquarters building is destroyed and all aforementioned personnel on the order of succession list are killed or incapacitated, the Division Engineer or a senior Division Staff Member selected by the Division Engineer will assume responsibility for the Field Division. The temporary headquarters facility will be located at Falcon Dam followed by

Presidio if the Falcon Dam office is in a state of disrepair. In the event neither location is available an effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Falcon Dam or Presidio operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
Water Accounting Systems	Amistad (Primary and backup)	El Paso, TX (Primary and backup)
GroupWise E-mail	El Paso, TX	Las Cruces, NM (backup)
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
GIS Mapping Database	Electronic			
Agency Vital Records (Directives, Treaties, Minutes, FAO Letter Log, Legal Documents, etc. all located on the I-Drive)	Electronic and Hardcopy	X (accessible via network)		X (Las Cruces to have backup center)
Property Database for Real Property	Electronic and Hardcopy	X (accessible via network)		
Personal Property Database	Electronic and Hardcopy	X (accessible via network)		
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)		

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Area Operations Manager or successor will make the determination as to whether it is possible to return to the primary work location, the IBWC, U.S. Section Amistad Field Division headquarters building. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section

Responsibility	Position
Update COOP annually	Assistant Area Operations Manager
Update telephone rosters quarterly	Assistant Area Operations Manager
Review status of vital files, records, and databases	Area Operations Manager
Conduct alert and notification tests	Assistant Area Operations Manager
Develop and Lead COOP training	Area Operations Manager
Plan COOP exercises	Area Operations Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the Falcon Dam Field Office/ conference room. The Falcon Dam location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software. In the event that American Dam is also inoperable, the tertiary operating location will be the Presidio Field Office where the same basic capabilities will be necessary.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the Field Divisions' essential functions, the ability to communicate with essential personnel, the

ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The Amistad Field Office, headquarters element will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The Amistad Field Office, U.S. Section, headquarters element will conduct its first telephonic recall exercise in April 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The Amistad Field Office Assistant Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the agency Assistant Area Operations Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Employee Alert Roster

Name	Home	Cell
Acy, Bobby R		775-4297
Aycock, Ernest P.	775-2585	
Brite, Cody M.		765-3425
Christensen, Verner D.	778-2852	
Conner, William A.	775-3082	719-3103
Duncan, John C.	775-7355	719-0058
Escobar, Juan Ramon	775-5470	703-9620
Garcia, Benito, Jr.	774-1034	765-6930
Garza, Silverio III	778-2801	
Gibson, Paul W.	719-1602	
Graham, Werner E.	575-706-7286	734-1545
Guerra, Alicia G.	774-6322	512-905-0477
Harris, William B.	774-5211	
Lehmann, John	422-2259	806-549-7353
Negro, Jaclyn M.		217-725-7684
Pena, Julian Joel	768-1194	
Potterton, Tina Ann		254-717-2370
Ramirez, Ricardo J.	775-2055	830-469-2957
Reynosa, Raymond U.	775-6148	
Smith, Glenn	563-9433	830-563-7731
Solorio, Ruben	774-0111	

Duty Person Cell Phone	734-9056
Security Guard Cell Phone	734-9650
Power Plant Cell Phone	422-6823

All numbers are 830 Area Code unless listed otherwise listed.

International Boundary and Water Commission

(U.S. Section)

Office/Name	Title	Office Phone	Home Phone
El Paso			5 U.S.C. 552(b)(6)
C.W. Ruth	Commissioner	915-832-4101	
Alfredo Riera	Principal Engr. O&M	915-832-4118	
Charles B. Kruse IV	Division Engr. O&M	915-832-4741	
USIBWC	Emergency Manager	915.832.4178	
Amistad Dam			
W. Graham	Area Operations Manager	830-775-2437	
B. Garcia	Power Plant Supt.	830-774-5519	
William Conner	O&M Supervisor	830-775-2437	
Cellular phone	Duty Person	830-734-9056	
Falcon Dam			
Silverio Garza, Jr.	Area Operations Manager	956-848-5211	
Scott Mullins	Asst. Area Operations Manager	956-848-5211	
Joel Garza	Power Plant Supt.	956-848-5265	

Lower Rio Grande Project

Patrick Daize	Area Operations Manager	956-565-3159
Rodolfo Montero	Asst. Area Operations Manager	956-565-3159

Presidio Field Office

Hector. Hernandez	Area Operations Manager	432-229-3751
USIBWC	Emergency Manager	915.832.4178

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission
Falcon Dam and Power Plant
P.O. Box 1
Falcon Heights, TX 78545

Under Revision

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I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the Falcon Dam Project office due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for agency leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the Falcon Dam Field Office for the IBWC, U.S. Section located in Falcon Heights, Texas. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the IBWC, U.S. Section.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Falcon Dam Field Office element of the IBWC, U.S. Section. Every field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. All field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes successful performance of the agency mission at the primary operating

location, for this COOP, it is the IBWC, U.S. Section Falcon Dam Field Office in Falcon Heights, Texas.

V. ESSENTIAL FUNCTIONS

The IBWC mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Binational Treaties
3	Flood Control
4	Water Conservation
5	Water Quality Management to include Wastewater Treatment
6	Generation of Hydroelectric Power

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the IBWC, U.S. Section will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Area Operation Manager from Falcon Dam Project will decide as to whether or not to activate the COOP. If the Area Operation Manager is unavailable, the Assistant Area Operation Manager at the IBWC Falcon Dam Project building will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the IBWC, U.S. Section Falcon Dam Field Office.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the Area Operation Manager will notify the Assistant Area Operation Manager, Power Plant Superintendent and Engineers about the situation. The Assistant Area Operation Manager, Power Plant Superintendent and Engineers will be responsible for notifying their respective Departments (O&M, Lease and Hydro, Power Plant, Water Plant). Area Operation Manager will notify their staff as appropriate about the situation. Employees that have been identified as emergency essential will report to secondary operating locations, Power Plant and Falcon Dam; the Falcon Dam facility being the primary operating location. The Executive Staff will decide where to station their essential personnel based on the situation. If the Falcon Dam location is unavailable due to similar problems at the facility, the Hydro and Lease office, will be used as the new operating location until reconstitution efforts come to completion.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Area Operation Manager will be succeeded by the following personnel in the listed order:

Successors
Assistant Area Operation
Power Plant Superintendent
Engineers

b. Delegations of Authority

In the event that the Area Operation Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the Area Operation Manager shall serve as Area Operation Manager.

c. Devolution

In the event that the Falcon Dam Project building is destroyed and all aforementioned personnel on the order of succession list are killed, the IBWC US Section Headquarters will assume authority for the agency. The temporary Falcon Dam Project facility will be located at Zapata County Building followed by Laredo Field Office.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Power Plant or Hydro and Lease operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
Water Accounting Systems	Falcon Hydro & Lease Office, Falcon Heights, TX (Primary and backup)	El Paso, TX (Primary and backup)
GroupWise E-mail	Falcon Dam Site	El Paso, TX (backup)
ILMS/ ARIBA	Falcon Dam Site	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
GIS Mapping Database	Electronic		X	
Agency Vital Records (Directives, Treaties, Minutes, FAO Letter Log, Legal Documents, etc. all located on the I-Drive)	Electronic and Hardcopy	X (accessible via network)	X	X (Las Cruces to have backup center)
Property Database for Real Property	Electronic and Hardcopy	X (accessible via network)	X	
PAO Database	Electronic and Hardcopy	X (accessible via network)	X	
Water Accounting	Electronic	X (accessible via network)		

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)		

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Area Operation Manager will make the determination as to whether it is possible to return to the primary work location, the IBWC, U.S. Section Falcon Dam Office building. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section

Responsibility	Position
Update COOP annually	Emergency Manager
Update telephone rosters quarterly	Emergency Manager
Review status of vital files, records, and databases	Chief, Information Management Division
Conduct alert and notification tests	Emergency Manager
Develop and Lead COOP training	Emergency Manager
Plan COOP exercises	Emergency Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the Hydro Power Plant or Hydro and Lease Office/ conference room. The Hydro Power Plant or

Hydro and Lease Office must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software. In the event that Hydro Power Plant or hydro and Lease Office is also inoperable, the tertiary operating location will be the REC Hall Office where the same basic capabilities will be necessary.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The IBWC, U.S. Section Falcon Dam element will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC, U.S. Section Falcon Dam element will conduct its first telephonic recall exercise in April 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The Area Operation Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented. The Area Operation Manager will also ensure that field offices have developed COOPs for their respective operations and that exercising is conducted on the same schedule as headquarters; every six months for telephonic recall and every year for functional and full-scale implementation.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the Area Operation Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission

Nogales Field Office

865 Rio Rico Industrial Park

Rio Rico, Arizona 85648

Under Revision

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I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the Nogales Field Office due to situations that prevent a healthy working environment. Elements of the COOP include Field Office essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for Field Office leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the Nogales Field Office of the IBWC, U.S. Section located in Rio Rico, AZ. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the Nogales Field Office, IBWC, U.S. Section.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Nogales Field Office element of the IBWC, U.S. Section. Each field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. All field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that

precludes successful performance of the agency mission at the primary operating location, for this COOP, it is the USIBWC Nogales Field Office in Rio Rico, Arizona.

V. ESSENTIAL FUNCTIONS

The Nogales Field Office mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the area of responsibility of the field office.

Priority	Essential Functions
1	Water Quality Management to include Wastewater Treatment
2	International Boundary Demarcation with Mexico
3	Water Accounting to Ensure Compliance with Binational Treaties

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the IBWC, U.S. Section will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Nogales Area Operations Manager (AOM), U.S. Section will decide as to whether or not to activate the COOP. If the AOM is unavailable, the senior ranking official at the IBWC, U.S. Section Nogales Field Office will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the IBWC, U.S. Section Nogales Field Office located at the Nogales International Wastewater Treatment Plant (NIWTP).

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the field office Area Operations Manager will notify local supervisors and managers, the Chief of O&M and the agency Emergency Manager. The local supervisors and managers will notify their staff as appropriate about the situation. Employees that have been identified as emergency essential will report to secondary

operating locations, Rio Rico Fire Station #2 and/or the City of Nogales Public Works Building; the Rio Rico Fire Station #2 facility being the primary operating location. If the Rio Rico Fire Station #2 location is unavailable due to similar problems at the facility (as it is located close to the Nogales International Wastewater Treatment Plant), the tertiary location, the City of Nogales Public Works Building, will be used as the new operating location until reconstitution efforts come to fruition.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Area Operations Manager will be succeeded by the following personnel in the listed order:

Successors
Assistant Area Operations Manager
Operations Supervisor
Maintenance Supervisor

b. Delegations of Authority

In the event that the Area Operations Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the U.S. Commissioner shall serve as Acting Area Operations Manager subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Chief of O&M.
2. All personnel actions shall be subject to prior consultation with the Chief of O&M.

c. Devolution

In the event that the Nogales Field Office building is destroyed and all aforementioned personnel on the order of succession list are killed, the Chief of O&M will assume authority for the Nogales Field Office. The temporary Nogales Field Office facility will be located at Rio Rico Fire Station #2 followed by the City of Nogales Public Works Building if the Rio Rico Fire Station #2 is in a state of disrepair. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Rio Rico Fire Station #2 or City of Nogales Public Works Building operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
GroupWise E-mail	El Paso, TX	Las Cruces, NM (backup)
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Water Accounting	Electronic and Hardcopy		X	
Treatment Plant Compliance Records	Hardcopy		X	X (El Paso)
Property Database for Real Property	Electronic and Hardcopy	X (accessible via network)	X	

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)		

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Nogales Area Operations Manager or successor will make the determination as to whether it is possible to return to the primary work location, the IBWC, U.S. Section Nogales Field Office Building building. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section

Responsibility	Position
Update COOP annually	Nogales Area Operations Manager
Update telephone rosters quarterly	Nogales Area Operations Manager
Review status of vital files, records, and databases	Nogales Area Operations Manager
Conduct alert and notification tests	Nogales Area Operations Manager
Develop and Lead COOP training	Nogales Area Operations Manager
Plan COOP exercises	Nogales Area Operations Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the Rio Rico Fire Station #2. The Rio Rico Fire Station #2 location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software. In the event that Rio Rico Fire Station #2 is also inoperable, the tertiary operating location will be the City of Nogales Public Works Building where the same basic capabilities will be necessary.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification

procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

XII.The IBWC, U.S. Section, Nogales Field Office element will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC, U.S. Section, Nogales Field Office element will conduct its first telephonic recall exercise in August 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The Nogales Area Operations Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented. COOP Plan Maintenance

The COOP will be maintained by the agency Emergency Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission

Presidio Project

110 S Dod Ave.

Presidio, TX 79845

Under Revision

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I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the headquarters office due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for agency leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the Presidio Project building for the IBWC, U.S. Section located in Presidio, Texas. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the IBWC, U.S. Section.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Presidio Project element of the IBWC, U.S. Section. Every field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. All field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes successful performance of the agency mission at the primary operating location, for this COOP, it is the IBWC, U.S. Section Presidio Project in Presidio, Texas.

V. ESSENTIAL FUNCTIONS

The IBWC mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	Water Accounting to Ensure Compliance with Binational Treaties
2	Flood Control
3	Water Quality Management to include Wastewater Treatment

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the IBWC, U.S. Section Presidio Project will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Presidio Area Operation Manager, U.S. Section will decide as to whether or not to activate the COOP. If the Presidio Area Operation Manager is unavailable, the senior ranking official at the IBWC, U.S. Section Presidio Project Yard will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the IBWC, U.S. Section Presidio Project Yard.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the Presidio Project Emergency Manager will notify the staff about the situation. Employees that have been identified as emergency essential will report to secondary operating locations, Presidio Project House. The Presidio Project Emergency Manager will decide where to station their essential personnel based on the situation.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Presidio Area Operation Manager will be succeeded by the following personnel in the listed order:

Successors
Fidel M. Baeza – Heavy Equipment Operator
Sergio S. Lopez – Heavy Equipment Operator
Jessica A. Nunez – Administrative Service Clerk

b. Delegations of Authority

In the event that the Presidio Area Operation Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the Presidio Area Operation Manager shall serve as Acting Presidio Area Operation Manager subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.
2. All personnel actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.

c. Devolution

In the event that the Presidio Project building is destroyed and all aforementioned personnel on the order of succession list are killed, the Chief, Operations & Maintenance Division assumes authority for the Presidio Project. The temporary facility will be located at the Presidio Project house 6 blocks west from the Presidio Project building. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the Presidio Project House operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
Water Accounting Systems	Presidio, TX	Relocate equipment to alternate location
GroupWise E-mail	Presidio, TX	Remote log-in
ILMS/ ARIBA	Presidio, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Hydro Data (History, records, measurement notes, rainfall, rating curve, and other document that deals with Rio Grande.)			X	
Inventory Documents			X	
Budget Document			X	
Personnel Documents			X	
Other Documents that are needed for the continuation of the Presidio Project			X	

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Presidio Area Operation Manager or successor will make the determination as to whether it is possible to return to the primary work location, the IBWC, U.S. Section Presidio Project Yard. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section Presidio Project.

Responsibility	Position
Update COOP annually	Emergency Manager
Update telephone rosters quarterly	Emergency Manager
Review status of vital files, records, and databases	Chief, Information Management Division
Conduct alert and notification tests	Emergency Manager
Develop and Lead COOP training	Emergency Manager
Plan COOP exercises	Emergency Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the Presidio Project House. The Presidio Project House location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The IBWC, U.S. Section, Presidio Project House element will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC, U.S. Section, Presidio Project House element will conduct its first telephonic recall exercise in April 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The agency Emergency Manager will

ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented. The Emergency Manager will also ensure that field offices have developed COOPs for their respective operations and that exercising is conducted on the same schedule as headquarters; every six months for telephonic recall and every year for functional and full-scale implementation.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the agency Emergency Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission

San Diego Field Office

2225 Dairy Mart Road

San Diego, CA 92173

Under Revision

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I. EXECUTIVE SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the San Diego Field Office due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for agency leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the primary operating location; in this case, it is the San Diego Field Office building for the IBWC, U.S. Section located in San Diego, California. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the IBWC, U.S. Section.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the San Diego Field Office. The Field Office has created and will maintain this COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes successful performance of the agency mission at the primary operating location, for this COOP, it is the IBWC, U.S. Section Field Office building in San Diego, California.

V. ESSENTIAL FUNCTIONS

The San Diego Field Office mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Binational Treaties
3	Flood Control
4	Water Conservation
5	Water Quality Management to include Wastewater Treatment

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the San Diego Field Office will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Area Operations Manager (AOM), San Diego Field Office will decide as to whether or not to activate the COOP. If the AOM is unavailable, the senior ranking official at the IBWC, U.S. Section San Diego Field Office will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the IBWC, U.S. Section San Diego Field Office.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the Area Operations Manager will notify their staff as appropriate about the situation. Employees that have been identified as emergency

essential will report to secondary operating locations, the South Bay International Wastewater Treatment Plant (SBIWTP) at 2995 Clearwater Way, San Diego, California. If the SBIWTP location is unavailable due to similar problems at the facility (as it is located close to the San Diego Field Office), then personnel will report from their personal residences and via cell phone until reconstitution efforts come to fruition.

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Area Operations Manager will be succeeded by the following personnel in the listed order:

Successors
Civil Engineer
Civil Engineering Technician

b. Delegations of Authority

In the event that the Area Operations Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the AOM shall serve as Acting AOM subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Division Engineer, Operations and Maintenance.
2. All personnel actions shall be subject to prior consultation with the Division Engineer, Operations and Maintenance.

c. Devolution

In the event that the San Diego Field Office building is destroyed and all aforementioned personnel on the order of succession list are killed, the Division Engineer, O&M Division will assume authority for the field office. The temporary field office facility will be located the SBIWTP if the San Diego Field Office is in a state of disrepair. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the SBIWTP operating location, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
GroupWise E-mail	El Paso, TX	Las Cruces, NM (backup)
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the IBWC, U.S. Section.

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Water Accounting	Electronic		X	
Treatment Plant Compliance Records	Hardcopy		X	X (El Paso)
Property Database for Real Property	Electronic and Hardcopy	X (accessible via network)	X	

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	
HR Records	Electronic and Hardcopy	X (all employee records are located at the National Finance Center)		

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Area Operations Manager or successor will make the determination as to whether it is possible to return to the primary work location, the IBWC, U.S. San Diego Field Office building. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the IBWC, U.S. Section

Responsibility	Position
Update COOP annually	AOM
Update telephone rosters quarterly	AOM
Review status of vital files, records, and databases	AOM
Conduct alert and notification tests	AOM
Develop and Lead COOP training	AOM
Plan COOP exercises	AOM

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the SBIWTP conference room. The SBIWTP location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software.

Interoperable Communications

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with other field offices and projects.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification

procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The IBWC, U.S. Section, San Diego Field Office will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary and tertiary operating locations. The IBWC, U.S. Section, San Diego Field Office element will conduct its first telephonic recall exercise in April 2009 and every six months thereafter; the first functional exercise will occur in December 2009 and every year thereafter. The agency Emergency Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented. The Emergency Manager will also ensure that field offices have developed COOPs for their respective operations and that exercising is conducted on the same schedule as headquarters; every six months for telephonic recall and every year for functional and full-scale implementation.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the agency Emergency Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.

Continuity of Operations Plan (COOP)

United States International Boundary and Water Commission

Yuma Field Office

1940 S. 3rd Avenue, Suite A

Yuma, Arizona 85364

Under Revision

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I. SUMMARY

The United States International Boundary and Water Commission's mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region. The Continuity of Operations Plan (COOP) was created in response to the challenges that threaten the United States government in the 21st century to include natural disasters and terrorism. The COOP will be activated in an event of an emergency where operations are impossible at the Yuma Field office due to situations that prevent a healthy working environment. Elements of the COOP include agency essential functions, activation and relocation, alternate facility operations, reconstitution, planning responsibilities, logistics, testing, training, and exercising, and plan maintenance.

II. INTRODUCTION

Having a practical COOP is very important to any federal organization. In the event of crisis, an agency may be forced to relocate its workforce and vital assets in order to continue functioning effectively. The International Boundary and Water Commission, U.S. Section has several mandated functions per executive orders, treaties, and other binational agreements; therefore, the agency is obligated to meet its mission at all times, including during times of crisis. This COOP will provide a basic foundation for office leadership in the event that staff and assets must be relocated. With recent natural disaster events in and around several field office locations, a new emphasis must be placed on having and exercising a viable COOP as mission essential functions must continue for the duration of any adverse event.

III. PURPOSE

Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements mandates that all federal agencies possess, maintain and exercise a Continuity of Operations Plan or COOP. The purpose of having a COOP is to continue to provide continuity of mission essential functions in the event of forced relocation caused by some adverse event that prevents the ability to maintain mission requirements from the Yuma field location. Because of today's changing operating and threat environment, this COOP is designed to address the all hazard threat posed to the Yuma IBWC, U.S. Section Field office.

IV. APPLICABILITY AND SCOPE

This COOP pertains exclusively to the Yuma Field Office element of the IBWC, U.S. Section. Every field office and project within the jurisdiction of the IBWC, U.S. Section, will create and maintain a COOP in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements. All field offices and projects will maintain the same format as this COOP. This plan addresses a full spectrum of potential threats, crises and emergencies (natural as well as manmade), and hazards. This includes adverse weather events, acts of terrorism, and any other scenario that precludes successful performance of the agency mission at the Yuma field office, located in Yuma, Arizona.

V. ESSENTIAL FUNCTIONS

The IBWC Yuma Field office mission is to provide binational solutions to issues that arise during the application of United States - Mexico treaties regarding boundary demarcation, national ownership of waters, sanitation, water quality, and flood control in the border region.

Priority	Essential Functions
1	International Boundary Demarcation with Mexico
2	Water Accounting to Ensure Compliance with Binational Treaties
3	Water Quality Management
4	Resource Management

VI. AUTHORITIES AND REFERENCES

This COOP is in accordance with the prescribed standards listed in Federal Continuity Directive 1 (FCD 1), Federal Executive Branch National Continuity Program and Requirements.

VII. CONCEPT OF OPERATIONS

In the event of crisis, the Yuma IBWC, U.S. Section Field office will activate the COOP using a three-phased approach; activation and deactivation, alternate facility operations, and reconstitution.

A. PHASE I: ACTIVATION AND RELOCATION

The activation and relocation process will follow the below mentioned sequence of events.

1. Decision Process

The Yuma Area Operations Manager (AOM), will decide as to whether or not to activate the COOP. If the AOM is unavailable, the Hydrologic Technician (by Seniority) at the Yuma IBWC, U.S. Section Field office will determine whether or not to activate the COOP. The plan will be activated in the event (both with and without warning) that operations can no longer be conducted at the primary facility, in this case, it is the Yuma IBWC, U.S. Section Field office.

2. Alert, Notification, and Implementation Process

Once a decision has been made to activate the COOP, the office Emergency Manager will be notified about the situation. The Area Operations Manager will be responsible for notifying staff and the Operations Division Manager in El Paso, TX. The Division Manager will notify their staff as appropriate about the situation. Employees that have been identified as emergency essential will report to secondary operating locations, U.S. Bureau of Reclamation Yuma Area Office (USBOR).

3. Leadership

a. Orders of Succession

In the event of a leadership absence caused by death, resignation, retirement, or incapacitation, the Area Operations Manager will be succeeded by the following personnel in the listed order:

Successors
Hydrologic Technician (by Seniority)
Hydrologic Technician (by Seniority)
Administrative Clerk

b. Delegations of Authority

In the event that the Area Operations Manager is absent for a period of more than one (1) workday, and in order to comply with the applicable treaties with Mexico, successors of the Area Operations Manager shall serve as Acting Area Operations Manager subject to the following conditions:

1. All budget, contracting and financial expenditure actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.
2. All personnel actions shall be subject to prior consultation with the Chief, Operations & Maintenance Division.

c. Devolution

In the event that the Yuma Field office is destroyed and all aforementioned personnel on the order of succession list are killed, the IBWC, U.S. Section Operations Division Engineer will assume authority for the office. The temporary Yuma Field office will be located at the USBOR facility. An effort will immediately be made to procure a new operating facility through GSA.

B. PHASE II: ALTERNATE FACILITY OPERATIONS

Upon arrival at the USBOR facility, the following systems, databases, files, and records will be necessary for continued operations.

1. Mission Critical Systems

These systems will electronically support continued operations.

System Name	Current Location	Other Locations
Water Accounting Systems	Yuma, AZ (Primary and backup)	Accessible via network
GroupWise E-mail	El Paso, TX	Accessible via network or internet
ILMS/ ARIBA	El Paso, TX	Remote log-ins using fobs

2. Vital Files, Records, and Databases

The following are vital files, records, and databases for the Yuma IBWC, U.S. Section Field office

Vital File, Record, or Database	Form of Record (e.g., hardcopy, electronic)	Pre-positioned at Alternate Facility	Hand Carried to Alternate Facility	Backed up at Third Location
Water accounting	Electronic & Hardcopy	X (accessible via network)	X	
Reports/Salinity/Records/letters (Letter Log, Documents, etc. all located on the I-Drive)	Electronic and Hardcopy	X (accessible via network)	X	System back up stored in fireproof safe at the Yuma office
Personal Property Database	Electronic and Hardcopy	X (accessible via network)	X	ILMS
Personnel Records	Electronic and Hardcopy	X (all employee records are available with HRO)	X	X (all employee records are located at the National Finance Center)

C. PHASE III: RECONSTITUTION

Once the crisis has subsided, the Area Operations Manager or successor will make the determination as to whether it is possible to return to the primary work location, the Yuma Field office. In the event that the building is in a state of disrepair, the Chief Administrative Officer will make the appropriate arrangements with GSA to find a new facility. Once the agency has returned to normal operations, agency management will conduct an After Action Report (AAR) to determine the effectiveness of COOP plans and procedures.

VIII. COOP PLANNING RESPONSIBILITIES

The following table shows COOP responsibilities for the Yuma IBWC, U.S. Section Field office

Responsibility	Position
Update COOP annually	Emergency Manager
Update telephone rosters quarterly	Emergency Manager
Review status of vital files, records, and databases	Area Operations Manager
Conduct alert and notification tests	Emergency Manager
Develop and Lead COOP training	Emergency Manager
Plan COOP exercises	Emergency Manager

IX. LOGISTICS

A. ALTERNATE LOCATION

In the event that the COOP is activated, the designated alternate operating location will be the U.S. Bureau of Reclamation Yuma Area office (USBOR). The USBOR location must provide adequate space and equipment for emergency essential personnel; the capability to perform essential functions within 12 hours of activation for up to 30 days; reliable logistical support, services, and infrastructure systems; interoperable communications; and computer equipment and software.

B. INTEROPERABLE COMMUNICATIONS

Communication systems such as traditional landlines, cell phones, Blackberrys, laptop computers using GroupWise e-mail, radios, and satellite phones will be used in the event of crisis. These communication mediums will be used to provide capability commensurate with the IBWC's essential functions, the ability to communicate with essential personnel, the ability to communicate with other agencies, access to data and systems, the ability to support COOP operational requirements, and interoperability with Headquarters and other field offices.

X. TEST, TRAINING, AND EXERCISES

Testing, training, and exercises will be used to familiarize staff members with their roles and responsibilities during an emergency, ensure that systems and equipment are maintained in a constant state of readiness, and to validate certain aspects of the COOP. Testing, training, and exercises planning will provide individual and team training of agency personnel, internal agency testing and exercising of COOP plans and procedures, testing of alert and notification procedures, refresher orientation for COOP personnel, and joint interagency exercising of COOP plans.

XI. MULTI-YEAR STRATEGY AND PROGRAM MANAGEMENT PLAN

The Yuma IBWC, U.S. Section Field office, will participate in a telephonic recall exercise every six months and an annual full-scale exercise where personnel and equipment will be deployed to secondary location. The Yuma Field office will conduct its first telephonic recall exercise in ? and every six months thereafter; the first functional exercise will occur in ? and every year thereafter. The agency Emergency Manager will ensure that proper training is conducted; exercise plans are formulated in accordance with likely disaster scenarios, exercises are accomplished to include maximum participation, After Action Reviews are performed, and recommendations are implemented.

XII. COOP PLAN MAINTENANCE

The COOP will be maintained by the office Emergency Manager. Updates to the plan will be made every three months to include new phone numbers, personnel, information, etc. Additional COOPs will be developed to reflect events such as Avian Influenza Outbreak.