

O&M INSPECTION GUIDELINES

These guidelines and the attached Operation and Maintenance Inspection Report were developed, reviewed and concurred in by the Natural Resources Conservation Service (NRCS), the Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB). These documents are provided and their use is recommended in conducting annual operation and maintenance inspections on floodwater retarding structures built under the PL-534, PL-566, Pilot and RC&D authorities.

General Information: Complete general information for the site. List Sponsoring Local Organization (SLO) that has responsibility for performing O&M. List other SLO's for the watershed project. At least one SLO should be present during the O&M Inspection (NRCS is there to provide assistance to the SLO, not to do the inspection for them). Everyone present during the inspection should sign the report in the designated space.

Hazard Classification: Circle current hazard classification as indicated on National Inventory of Dams List, also circle "Needs Re-evaluating" if present downstream conditions indicate that current classification may not be correct. If the dam is classified as high hazard, circle Y or N to indicate if an Emergency Action Plan has been developed and is on file.

Access Route: Site should be accessible in all weather conditions in the event there is an emergency situation. Poor access usually means poor O&M. Trees or brush may need trimming or mud holes in access roads may need repairing. Gates should be either unlocked or authorized personnel should have keys or other means for reasonable access.

Water Level in Reservoir: Document approximate water level in reservoir for information purposes. (ie. dry, 2 feet below principal spillway crest, principal spillway submerged, 1 foot below auxiliary spillway crest, etc.) Unusually high or low water levels could be reason for concern.

Fence – Gates: Record conditions as they were when you arrived and when you left site.

Livestock Grazing: Record type and approximate number of livestock on the site or that have access to it. If over grazed, sponsor should consider removing livestock and closing gates if possible. Make certain that livestock are not left fenced in on the dam if watering source is not available. (State grazing condition: ie. needs grazing to stimulate vigor, properly grazed, severely over grazed, not grazed in several years, etc.)

Development/Landrights: Record any development or construction activities in or adjacent to easement boundaries and in downstream floodplain area. (ie. new house slab being poured below or near auxiliary spillway crest elevation upstream of dam, new home constructed approximately 1,000 feet downstream of dam near creek bank, etc.)

Embankment: Settlement along the crest of the dam, deformation or bulging of the slopes, longitudinal or transverse cracking, jug holes leading to cracks, or loss of berm width or top of dam width should be carefully traced out, mapped and reported. Most of these conditions are not usually observed unless the slopes of the embankment are physically walked out.

Non-typical or wet area vegetation on back slope or near back toe usually is an indication of seepage. Milky or cloudy seepage is usually a sign of internal erosion or piping problems as are sand boils or sand cones. These should be reported to an engineer immediately.

Trees and brush not only interfere with maintaining a healthy grass stand on the embankment slopes, they also cause internal damage to the embankment with their roots. Trees and brush should be controlled before

they reach 1" in stem diameter to prevent roots from penetrating into the core of the dam. Routine weed spraying including small amounts of brush herbicide will usually suppress most trees and brush when they are small. All trees, brush, briars, etc. should be controlled in a timely manner. This type of vegetation is also an invitation to burrowing or rooting animals like armadillos, coyotes, feral hogs, etc.

Trees growing along the waterline or on the wave berm usually consist of willows and cottonwoods (trees preferred by beavers and nutria). Eliminating their preferred trees is a key step in controlling these animals and encouraging them to move elsewhere. Beaver damage (tunneling) on the wave berm and into the front slope is usually considered a maintenance item to be corrected by the SLO. If damage is significant or is in the vicinity of the principal spillway or conduit, an engineer should be requested to assist with the assessment. Maintain an adequate vegetative cover or rock riprap on wave berm for wave protection. Fences should be maintained around vegetative wave berm plantings to provide thick, healthy stands of grass for wave protection. Vegetative wave berms should rarely be grazed.

Adequate vegetation should be maintained on the slopes to prevent erosion. Over grazing is detrimental to a healthy grass stand. Continued over grazing could lead to excessive erosion and the complete loss of the grass stand; thus requiring the replanting of the grass. No grazing for several continuous years can also lead to a non-vigorous grass stand.

Principal Spillway: Broken, missing, or damaged debris guards and trash racks need to be repaired immediately to prevent debris from entering the inlet. Once debris gets into the inlet or conduit it is difficult and expensive to remove. If not removed and the principal spillway becomes completely obstructed, the entire embankment and auxiliary spillway are in jeopardy.

Excessive corrosion can cause metal components to become non-functional or fail completely. The gate valve should be maintained in an operable condition. It should open and close without excessive force. Deteriorated, cracked or broken concrete should be repaired as soon as possible. Any unauthorized modifications to the inlet to alter the water level of the reservoir should be removed. Leaks should be monitored as to determine the cause. Vent pipes, orifice plates, and manhole covers should be in place and kept operable unless removal has been authorized and documented in the as-built plans. Screen wire, hardware cloth, chain link fence, and other restrictive materials mounted on the inlet to prevent grass carp or other fish from leaving the reservoir are not authorized and should be removed.

Principal spillway conduit should be inspected for joint separation, leaks, corroded metal, deteriorated concrete, obstructions and submerged outlets. Usually a small boat is needed to gain access to the inlet for inspection. Necessary safety precautions should be observed when utilizing a boat and while on or near the principal spillway inlet for inspection. Avoid being on or near the principal spillway inlet when appreciable flow is entering the principal spillway (you don't want to get sucked into the structure). Embankment slopes should be inspected near the inlet and outlet for sinkholes or depressions that would indicate joint separation and loss of soil material around the pipe.

Plunge Pool, Impact Basin, and Outlet Channel: Impact basin should be inspected for deteriorated or misaligned concrete surfaces and damage to fencing around the basin. Toe drain outlets should be kept open, free of debris, and rodent guards in place. Excessive drainage or a lack of drainage should be cause for concern. Trees and brush should not be allowed to grow within 10 feet of any concrete component of the structure.

Outlet pipe should remain above the water surface elevation of the plunge pool during full pipe flow, if not the downstream outlet channel needs to be cleared of obstructions. The plunge pool area and exit channel should be stable without excessive erosion. Rock rip rap, concrete weirs and other erosion

control structures should be maintained in place. Pipe supports should be in place and providing adequate stability for the outlet pipe.

Auxiliary (Emergency) Spillway: An adequate vegetative cover to prevent erosion should be maintained on all areas of the auxiliary spillway (side slopes, dikes, diversions, crest section, forebay and downstream areas below the crest section). Excessively eroded areas should be noted and corrective measures planned. As a minimum, trees and brush should be controlled before they reach 1” in stem diameter or on a 2-3 year cycle. Sedimentation and debris deposits should be removed to prevent capacity reduction and concentrated flow areas. If grazing or hay harvesting is allowed, hay should never be stored in the auxiliary spillway and concentrated feeding areas (hay feeding rings or feed troughs) should never be located inside fenced areas of the embankment or auxiliary spillway (this leads to erosion by loss of vegetation, livestock trailing and vehicle traffic). Equipment, farm machinery or any other items that would cause an obstructed flow or provide an invitation to burrowing animals should not be allowed in the auxiliary spillway or embankment areas.

Roller Compacted Concrete (RCC), soil cement, and articulating block structures should be inspected for deterioration, irregularities, separation of joints, damaged components, unusual cracking, misalignment and displacement of blocks or rock rip rap. Significant irregularities should be mapped and reported to an engineer for detailed investigation. Trees and brush of any size should not be allowed to grow on any of the armor plated surfaces mentioned in this section. Safety fences should be inspected for damaged or missing components.

Fences, Gates & Barriers: All fencing, gates and barriers should be maintained in a good operating condition that provide control of traffic (livestock, people, vehicles, etc.) for the intended purpose. Only authorized alterations are allowed on fences, gates and barriers on works of improvements and should be documented in the as-built plans. Debris should be removed from fences and properly disposed of to prevent it from causing additional damage to the fence or entering the principal spillway. Safety fences should be maintained in designated areas to prevent injury or entry into unauthorized areas (impact basin, stilling basin, RCC structures, security areas, etc.).

Recreational Facilities: As-built plans should be utilized to provide guidance in inspecting recreational facilities (number of facilities and location). If needed, a qualified engineer should inspect boat docks, fishing piers, pavilions, and other structures requiring structural integrity.

Instrumentation, Survey Markers, & Security Devices: All security devices, early warning systems and instrumentation should be in place and operational. Concrete monuments with brass caps and other survey markers should be maintained in original locations and elevations.

Previous Inspections: Inspectors should have information of previous inspections available in order to know if maintenance needs have been an on going issue or are new occurrences. Inspectors could also use this information as a follow-up to monitor effectiveness of previous repairs and maintenance.

Maintenance Needs: Items needing maintenance should be listed by item number with enough description of the problem that the person doing the maintenance could follow-up adequately. If desired the description could estimate the amount of time to complete the maintenance or the estimated cost for the maintenance. If the item listed is a major structural repair or design deficiency (slope failures, significant principal spillway problems, concrete conduit failures, etc.), the site may be already on the state repair list or may need to be added to the list. In this case an engineer should be requested to assist with the assessment.