Issue 14: Resource Needs for the Dam Safety Program

A. Brief Description of Issue

The number of dams the Dam Safety Program is required to inspect each year continues to increase. This yearly increase is largely from reclassifying dams due to increased development downstream, and to a lesser extent, new dams and existing but previously unknown dams.

The program was able to complete 91% of the inspections for the five-year cycle at the end of FY 2019 and 89% of the inspections at the end of FY 2020. However, without an increase in staffing resources, this percentage will continue to decrease each year as additional inspections are added to the inspection cycle.

B. Discussion

The current inventory of dams in Texas includes 7,314 dams, not including 116 federal dams.[10] The current number of dams that fall under TCEQ's jurisdiction is 4,049. The remaining 3,265 dams are exempt dams,[11] which are not subject to routine dam safety inspections but must comply with operation and maintenance requirements. For the 4,909 dams that are regulated, 1,502 are high hazard dams,[12] 304 are significant hazard dams,[13] and 2,243 are low hazard dams. For the 3,265 exempt dams, 242 are significant hazard dams and 3,023 are low hazard dams.

As the population of Texas increases, more people are moving into areas downstream of dams. Many of these dams were previously classified as low hazard since the downstream areas were sparsely populated or unpopulated. TCEQ is not required to inspect low hazard dams, except in certain situations. Additional development downstream increases the potential for loss of life if a dam were to fail, requiring many of these dams to be reclassified from low to significant or high hazard. These reclassified dams are added to TCEQ's inspection cycle each year. In comparison, at the end of FY 2014 the program had 1,568 high and significant hazard dams in the inspection cycle. However, at the end of FY 2020 the number of dams in the inspection cycle had increased to 1,806, which is an additional 238 dams in the inspection cycle as compared to the previous six-year period. With this increase in hazard classification continuing to occur and dams being added to TCEQ's five-year inspection cycle each year, the program's ability to complete all the required inspections within five years has been impacted as shown in the following graph.

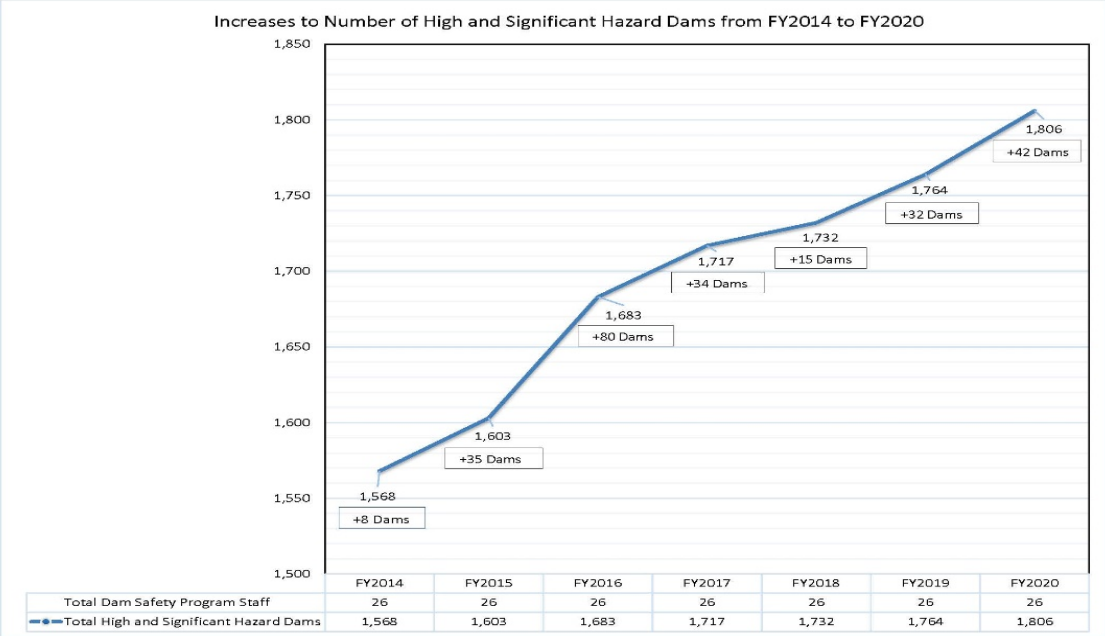
[10] Federal Dams – Texas Dam Safety Rules do not apply to dams owned and maintained by federal agencies such as the Corps of Engineers, International Boundary and Water Commission, and the Bureau of Reclamation as per 30 TAC Section 299.1(c)(1).

[11] Exempt Dams - Dams on private property are exempt, if: they impound less than 500 acre feet of water; are significant or low hazard; are located in a county with a population less than 350,000; and are not within corporate limits of a municipality as per TWC Section 12.052(e-1)(1)(2)(3)(4). While an owner of an exempt dam is not required to meet dam safety requirements, and are not subject to routine dam safety inspections, they must comply with operation and maintenance requirements as per TWC Section 12.052(e-2).

[12] High Hazard Dams – In the event of dam failure, loss of life is expected, including seven or more lives, or three or more habitable structures in the breach inundation area downstream of the dam, as per 30 TAC Section 299.14(3).

[13] Significant Hazard Dams - In the event of dam failure, loss of life is possible, one to six lives, or one to two habitable structures in the breach inundation area downstream of the dam, as per 30 TAC Section 299.14(2).

Number of High and Significant Hazard Dams from FY 2014 to FY 2020



In addition to the increasing number of dams in the inspection cycle, Texas, like other states, has difficulty attracting and retaining dam safety engineers. The state cannot compete with the salaries of private engineering companies. In many instances the program serves as a training opportunity for new engineers who need to gain experience. The program is most successful at hiring engineering graduates who then become engineers in training (EITs), working under the direction and mentorship of the program's licensed professional engineers. After working in the program for several years most of the EITs become professional engineers and then leave TCEQ to join private engineering companies. While the program benefits from having the EITs, the frequent turnover can result in a decrease in inspections due to time needed to fill vacant positions and train new staff. TCEQ began using recruitment bonuses and targeted salary increases for engineering levels in FY 2018; however, the program has continued to experience turnover. There are currently 26 full-time equivalent (FTEs) employees in the program, which include one manager, three team leaders (three teams), one systems analyst, and 21 field inspectors. The 26 program FTE employees, further broken down by professional title, include 15 professional engineers, eight graduate engineers, two non-engineers, and one systems analyst.

The work performed by the program is considered engineering work by the Texas Board of Professional Engineers, which requires a staff of engineers to review the data and information submitted by consulting engineers and to conduct engineering inspections in accordance with Title 30 Texas Administrative Code (30 TAC) Sections 299.4 and 299.42.

TCEQ has an interagency contract (intergovernmental) with the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) that provides for the NRCS to inspect a specified number of the high and significant hazard NRCS-assisted project dams. The NRCS submits the reports to the program, which develops letters to send with reports to the dam owners. Currently, the NRCS is contracted to perform 80 inspections per year.

The primary focus for the program is dam safety inspections on 1,806 high and significant hazard dams, 1,502 high and 304 significant state-regulated, every five years as required in 30 TAC Section 299.42(a)(2). In accordance with 30 TAC Section 299.42 (a)(2), high and significant hazard dams and large low hazard dams, of which there are only three in the inventory, are scheduled to be inspected every five years. While small and intermediate size, low hazard dams are only to be inspected at the request of an owner, as a result of a complaint, at the request of someone other than the owner, following an emergency such as a flooding event, or to determine the hazard classification.

The program also inspects poor condition high and significant hazard dams on a two-year frequency. Poor condition dams are those with major maintenance, structural, or hydraulic deficiencies which could threaten the integrity of the dam if the owner does not take immediate action. This shorter inspection cycle is needed to determine if previously identified problems with poor condition dams have been corrected or if the situation is progressing to the point of being an imminent and substantial endangerment to public safety. There are 300 poor condition regulated dams, of which 204 are high hazard dams, 40 are significant hazard dams, and 56 are low hazard dams. There are also 92 poor condition exempt dams with 63 being significant hazard dams and 29 being low hazard dams.

The program also has a Legislative Budget Board performance measure target of 800 assessments each year, which includes completed dam safety inspection reports and assessment reports.

The State Auditor's Office (SAO) noted in an FY 2020 audit that the program was not adequately following up on maintenance requirements at dams, trying to get more Emergency Action Plans (EAPs) submitted, or working with owners to perform EAP tabletop exercises. The agency responded to SAO that the program will require additional resources to perform these tasks.

In 2011, the legislature temporarily exempted certain dams from agency rules and regulations through HB 2694 (82R). The Act amended Texas Water Code (TWC) Section 12.052 to put in place a temporary dam exemption. This exemption went into effect September 1, 2011, exempting the owner(s) of a dam on private property from meeting the requirements related to dam safety if the dam:

- impounds less than 500 acre feet at maximum capacity;
- has a hazard classification of low or significant;
- is located in a county with a population of less than 215,000; and,
- is not located inside the corporate limits of a municipality.

The owner(s) of the exempt dams were still required to comply with operation and maintenance requirements established by commission rule. This exemption was set to expire on August 31, 2015. The Act also added a requirement to identify and focus on the most hazardous dams, and allowed the agency to enter into agreements with dam owners who are required to reevaluate the adequacy of an existing dam or spillway and authorize deferral of compliance with the criteria, as appropriate.

In 2013 the legislature made the dam exemptions permanent through HB 677 (83R). The Act also amended TWC Section 12.052 to change the dam exemption criteria related to population by increasing the county population requirement to less than 350,000, and repealed the dam exemption expiration date set in HB 2694 (82R), making the dam exemption permanent.

In 2019, HB 137 (86R) requires TCEQ to report changes of the hazard classification. The bill requires TCEQ to report to the county or city emergency management director or the executive director for the local

council of government any changes to the hazard classification of a dam in that county to high or significant hazard and the condition within 30 days of the change. TCEQ was also required to provide a biannual report to the same offices starting on March 1, 2020, with the condition for each high and significant hazard dam in that county.

C. Possible Solutions and Impact

While the program has increased the workload for existing staff, the focus remains on the quality and thoroughness of inspections to help ensure Texas dams remain safe. With the increasing number of dams being added to the five-year inspection cycle each year, the agency is recommending an increase to the current FTE levels.

The program would need a staff of at least 37 FTE employees to keep up with the five-year inspection cycle, the increased inspection frequency for poor condition dams, and efforts to incorporate the recommendations from the SAO. This is 11 more than the current program staff level. A program with 37 FTE employees would allow the agency to create a fourth team and add an additional team leader. If only a few additional FTE employees were allocated, along with adequate additional funding, it may be possible to contract the services, with program oversight.

The following are strategies to address the concerns:

1. For the Dam Safety Program to meet 100% of the five-year inspection frequency, it is recommended that the staff level be increased by 11 FTE employees.
2. Increase the salaries for all engineering levels to help attract qualified candidates and retain current program staff.
3. Continue to use recruitment and retention bonuses to help retain the current program staff.