

WEBER-BOX ELDER CONSERVATION DISTRICT

Findings and Recommendations Related to
Flooding in the Douglas-Hiland Neighborhood of Ogden City, Utah

Report No. 16-WBEC-8La



OFFICE OF THE
UTAH STATE AUDITOR

WEBER-BOX ELDER CONSERVATION DISTRICT

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Flooding in the Douglas-Hiland Neighborhood of Ogden City, Utah

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AUDIT LEADERSHIP:

Van Christensen, CPA, CFE, Audit Director
Tyson Plastow, Special Projects Senior Auditor



OFFICE OF THE
UTAH STATE AUDITOR

REPORT NO. 16-WBEC-8La

November 10, 2015

Board of Trustees
Weber-Box Elder Conservation District
471 West 2nd Street
Ogden, UT 84404

Dear Board Members:

The Office of the Utah State Auditor has a hotline program, through which we receive complaints related to state and local governments. We received complaints related to the groundwater flooding which began to occur in the Douglas-Hiland neighborhood in Ogden City, Utah at the end of June 2015. The primary complaints centered on the perception that all of the providers of water were not adequately working to identify the cause of the flooding.

The results of our investigation into the complaints as they relate to the Weber-Box Elder Conservation District are included in the attached findings and recommendations section of this report.

If you have any questions regarding this report, please contact me.

Sincerely,

Van Christensen, CPA, CFE
Audit Director
801-538-1394
vchristensen@utah.gov

cc: Terel H. Grimley, General Manager, Weber-Box Elder Conservation District
Ogden City Council
Mike Caldwell, Mayor of Ogden City
Weber County Commission

WEBER-BOX ELDER CONSERVATION DISTRICT

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WEBER-BOX ELDER CONSERVATION DISTRICT

FINDINGS AND RECOMMENDATIONS RELATED TO FLOODING IN THE DOUGLAS-HILAND NEIGHBORHOOD OF OGDEN CITY, UTAH

BACKGROUND

At the end of June 2015, groundwater flooding began to occur in the Douglas-Hiland neighborhood (Neighborhood) of Ogden City, Utah (City). The City's Water Utility Department provides culinary water to the Neighborhood, and the Weber-Box Elder Conservation District (District) provides secondary water to the Neighborhood.

The District is one of three member entities that commonly operate under the name of "Pineview Water Systems" (Pineview). Pineview is not organized under a legal form such as a local government, corporation, or nonprofit. The additional entities that compose Pineview are the Ogden River Water Users Association, a nonprofit corporation, and the South Ogden Conservation District. Both districts (South Ogden and Weber-Box Elder) are governmental entities created by Weber County in the early 1930s. They are governed by elected boards. Board elections are weighted by watershare. Because the flooding in the Neighborhood was within the boundaries of the District, this report specifically addresses the District. However, because the three legally separate entities collectively operate under the Pineview name, some matters address Pineview as well.

While this report makes recommendations for responding to water leaks and flooding, its primary focus is on weaknesses in District governance that contributed to an ineffective response to the flooding. This report addresses weaknesses and recommendations specific to the District. A separate report addresses our investigation in regards to the City.

FINDINGS AND RECOMMENDATIONS

When groundwater flooding was reported in the Neighborhood, both the District and City responded to evaluate the possibility that a leak in their water system was the source of the water which flooded the basements of homes in the Neighborhood. As flooding continued, affected homeowners grew frustrated with both entities for not doing enough to identify the cause of the flooding, find a solution to stop the flooding, and pay for repairs and clean up of the flood debris. Homeowners reached out to a number of public officials; however, most homeowners were unaware that the District existed and was a governmental entity comprised of elected officials who should have been an early point of contact.

We noted the following weaknesses relating to the District:

1. INEFFECTIVE BOARD GOVERNANCE AND LACK OF ACCOUNTABILITY

The District board did not seem to understand the significance of the flooding and the need to provide effective oversight. For example, the flooding was first reported on June 28, 2015. The board should have used its July board meeting to ensure the emergency response was timely and effective, but the board decided to cancel its July meeting.

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We asked the board chair if the board was satisfied with the District's response to the flooding, and he indicated they were generally satisfied, with the exception of a need for better communication with affected homeowners. In contrast to the board's perception, this report outlines deficiencies in District management's knowledge, skills, and expertise – attributes that the board is responsible for ensuring are sufficient enough to enable a timely and effective response to emergency water situations. (See related Finding No. 2.)

The board's complacency regarding effective governance appears to be caused by a lack of accountability. Management of the District is accountable to the governing board, who is accountable to the citizenry through the election process. However, extremely low voter participation and the small number of candidates filing for District board election in recent years may have minimized accountability and allowed for ineffective governance and management. For example:

- 2015 election – cancelled, 3 candidates filed for three open positions.
- 2013 election – cancelled, two candidates filed for two open offices.
- 2011 election – 11 votes out of 11,450 potential voters (.096%).
- 2009 election – 271 votes out of 5,435 potential voters (4.99%).

The District's general manager explained that only 4 times during the past 26 years has a District election been necessary. We contacted 12 Utah entities that provide secondary water and found that 5 have publicly elected boards (the remaining 7 boards are appointed), and 4 of these 5 have canceled or could have cancelled their elections for the past 4 election cycles. One entity even had to appoint a board member because no candidates filed. Low voter participation and the small number of candidates may be caused by the following factors:

Confusion Over the Entity Name

The District's election and the associated notice are under the legal name of Weber-Box Elder Conservation District. However, all services and fees for the Neighborhood are provided and collected under the nickname of Pineview Water. For example, the administration building, vehicles, uniforms, email addresses, and website all prominently display the Pineview name. Also the tax notice prepared by Weber County lists "Pineview Water" as the name of the entity collecting the fee. We asked the Weber County Treasurer why the tax notice lists Pineview rather than the Weber-Box Elder Conservation District who is the taxing entity. He stated that when the tax notice listed the Weber-Box Elder Conservation District by its official name they received a number of calls questioning what services the District provided. The Weber County Treasurer decided to change the name on the tax notice to Pineview, the nickname, so fee payers would recognize it. Therefore, if a citizen saw a notice of an election or ballot for the Weber-Box Elder Conservation District, most would not recognize the services the District provided or the need to participate in the election.

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Election Procedures

The District complied with the laws outlining procedures for holding elections. However, when we discussed the low voter turnout and candidate participation with the deputy director of elections in the Lieutenant Governor's Office, he suggested that the District could improve voter and candidate participation by publishing election information on a website and directly mailing notices and ballots. Also, existing election laws may need to be revised to improve voter notification and participation.

Recommendations:

We recommend that the board:

- **Provide effective oversight of management by holding management accountable and ensuring they have the necessary knowledge, skills, and expertise.**
- **Resolve confusion among constituents regarding the entities that serve them, the individuals responsible for governance and management of those entities, and to whom those individuals are accountable.**
- **Strive to improve voter participation, such as through directly mailing candidate filing notices, election notices, and ballots; posting election information on the District's website; and asking the County to also post District election information on their website.**

2. FAILURE TO EFFECTIVELY EVALUATE AND IDENTIFY THE RESERVOIR AS THE MOST LIKELY CAUSE OF FLOODING

We obtained from the District a timeline and list of procedures completed by them to determine whether their water system was the source of the leak. In order to evaluate the appropriateness of the District's response, we contacted the Utah Water Users Association (Association) and asked for a recommendation of an expert in this area. The Association recommended two individuals, one of which was a professional engineer with a Ph.D., from the engineering firm of Hansen, Allen & Luce Engineers (Engineering Firm).

The Engineering Firm evaluated the timeline and other available information and indicated that given the uphill proximity of a District reservoir to the east of the affected homes, the amount of groundwater, and the geology of the area, the District should have immediately checked the reservoir. However, the District indicated that they surveyed the reservoir two days after the flooding was reported rather than immediately upon notification. One purpose of checking the reservoir should have been to evaluate the risk of a catastrophic failure threatening life and property; thus, the need for an immediate response. Checking the

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reservoir should also include checking the condition of the embankment and changes in water levels.

The Engineering Firm indicated that after the initial emergency response phase, the leak was not an immediate threat to life and it posed minimal short-term threats to health. The affected area peaked at about 14 homes and did not appear to be expanding. It is the Engineering Firm's opinion that such a situation represented a nuisance and did not require the same response as a catastrophic emergency situation. A stronger response could have unnecessarily risked reducing water users' access to their water rights, resulting in potentially significant crop and monetary loss. However, although the leak did not pose a major threat to life, it was the cause of significant damage to property; therefore, the District should have continued to actively look for the source of the leak.

On July 23, 2015, we discussed with the District the possibility of a leak at the irrigation reservoir to the east of the impacted area. The District communicated its confidence that the reservoir was sound. On August 9, 2015, more than 6 weeks after the flooding was reported, the District drained the reservoir and discovered a leak in the reservoir lining. Because homes immediately below the reservoir did not have flooding, the District did not recognize or understand the possibility that water may travel underground for some distance from the leak before manifesting on the surface. The Engineering Firm stated that the geology along the Wasatch Front is fairly similar and that long distance underground flows are likely to occur.

The District indicated that they routinely checked the reservoir lining at the end of the irrigation season. It is the Engineering Firm's opinion that it is more critical to check reservoir linings in the spring, before the reservoir is filled, to ensure that no damage occurred over the winter period.

Recommendations:

We recommend that the District:

- **Improve emergency leak response by immediately investigating and identifying potential imminent threats to life and property.**
- **Ensure that personnel have the necessary industry knowledge, skills, and expertise to identify and investigate catastrophic threats.**

3. LACK OF KNOWLEDGE, SKILLS, AND EXPERTISE RELATED TO INDUSTRY "BEST PRACTICES"

District management and personnel lack the necessary industry knowledge, skills, and expertise to respond to water system emergencies. The District never tested the chemical composition of the flood water, a test which is specifically designed to identify the source of

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water. The City completed a chemical composition test the first day the flooding was reported. When we questioned the District about chemical composition tests, they stated that they were unfamiliar with some of the available tests, including water chemical composition testing and chemical tracer testing.

We contacted managers at four separate entities that provide secondary water in order to identify best practice methods for dealing with flooding caused by leaks. Various methods were identified; however, based upon our discussions, three procedures were consistently identified, as noted in A, B, and C, below:

A. Discover the source of the water. Methods include:

- Dye testing
- Chemical tracer testing
- Chlorine testing
- Fluoride testing
- Water chemical composition testing

B. Stop or slow the flow of water. Methods include:

- Shutting off lines near the flooding
- Shutting off water in the region
- Shutting off the system

C. Find and fix the leak. Methods include:

- Pipe sounding
- Digging test holes
- Surface Surveys
- Placing camera or sonar inside the pipe
- Piezometer

The District did not use any of the methods noted in “A” above to “discover the source of the water,” nor did they place a camera/sonar in the pipe or a piezometer. While some of the methods noted above may be conducted simultaneously and have dual purposes, the recommended sequence is logical during a non-catastrophic emergency because identifying the source of the water assists in identifying which lines to shut off and which systems may be leaking.

The Engineering Firm stated that using dye testing or chemical tracers in the irrigation reservoir would have indicated there was a leak. However, it would not have identified a specific leak or the volume of the leaking water; thus, the District would need to perform further procedures to locate the leak.

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Recommendation:

We recommend that the District ensure that management and other personnel have the necessary industry knowledge, skills, and expertise to respond to leaks or other water system emergencies in accordance with industry best practices and ensure that they are accountable for their response to the situation.

4. INADEQUATE SYSTEMATIC EMERGENCY RESPONSE PLAN

The District's response to the flooding appeared to be haphazard and unsystematic and did not focus on the priorities of discovering the source of the water, stopping or slowing the flow of water, and finding and fixing the leak.

Although the District has emergency response procedures, the procedures were adopted more than 30 years ago and have not been updated to take into consideration changes in technology and risks with an aging infrastructure. The District's response procedures are one page long and appear incomplete.

We found an example of a good response plan from an irrigation company in Utah which had formed a 42-page emergency plan for just one of its reservoirs. The plan included contact numbers, flow charts, specific potential threats, instructions for how to respond to an emergency, and the designation of incident authority. The plan had been reviewed and updated this year, and the irrigation company had distributed copies to all appropriate emergency responders.

An emergency response plan helps individuals know the sequential order of actions to take when an emergency arises and minimizes the time needed for discussing and planning an appropriate response. An emergency response plan should include an inventory of internal and external emergency resources, an assessment of potential emergencies, and designation of who has incident authority. It should focus on protecting people and property and should be regularly updated by identifying ongoing weaknesses and threats.

Recommendation:

We recommend that the District improve the timeliness and quality of their response to emergencies by preparing and regularly updating an emergency response plan that systematically identifies threats, weaknesses, and responses that include industry best practices.

WEBER-BOX ELDER CONSERVATION DISTRICT

471 WEST 2ND STREET • OGDEN, UTAH 84404

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November 3, 2015

Mr. Van Christensen, CPA, CFE
Audit Director
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Salt Lake City, Utah 84114-2310

Dear Mr. Christensen:

The District has reviewed the draft of your management letter, and the associated findings related to the District and its response to the groundwater flooding in the Douglas-Hiland neighborhood in Ogden City, Utah at the end of June 2015.

We feel that your stated findings are not fully accurate and are simply inconsistent considering the efforts and decisions made by the District to find the source of the groundwater. The time line you refer to and have used in your findings is a brief description of events and an outline of dates of specific actions taken. It is not all inclusive of the daily events and does not take into consideration the particular steps taken, internal analysis, standard operational procedures of reservoir water level management, inspection and observation, as well as decisions made with respect to the response and efforts made to locate the source of the ground water.

The homeowners' frustration and concern with the amount of time it takes to find the source of ground water problems is understandable; however, the District was fully engaged in efforts to identify if District facilities were the source.

The District offers the following in response to your findings:

The District was well aware of the flooding. It began with one home and eventually spread to several others. The July Board meeting cancellation had no impact on efforts to identify the source of the water. The district's personnel were engaged in conducting proper and proven methods of leak detection to try to identify the source of the water and if it was coming from a District facility. The area had just received more than 10 inches of rain in the preceding two

months. In addition, Board oversight was not needed because the district personnel were in the investigative stages and following proper procedures.

District management regularly reports ongoing actions and situations of concern that occur to the Board in regular monthly Board Meetings. The relationship of low voter turnout and the small number of candidates filing for District board election in recent and past years has no relationship or correlation to Board governance and management accountability. Each District board member is a highly qualified individual in their respective profession and has a great deal of expertise in issues related to the District. They have attended training seminars and conferences annually including the Utah Water Users Workshop, the Water Summit, and the Utah Association of Special District Annual Conference.

Board elections, candidate filings, and voter participation has historically been varied since creation of the District in 1934 just as any other election process in the State. The State Legislature has tried various methods in efforts to increase voter participation by changing election dates from having a separate date in December for Irrigation District elections to combining with Municipal and General Election dates, none of which has changed the number of candidate filings nor voter participation.

The recommendations offered are noted. The Board does provide proper oversight of management and hold them accountable for their actions. We have discussed the issues related to this matter and do provide training and procedures to ensure skills and knowledge are in accordance with industry practices. The second recommendation is an ongoing process of education of constituents. A new website is being implemented with that objective. The website will also help with voter information and hopefully participation in the future. The distinction between the entities is a major focus and will be highlighted.

There was no failure to effectively evaluate and identify the source of the ground water. The Districts response was appropriate and effective in eventually identifying the source of the ground water.

The criticism of the District's response was based on information concerning the District's actions listed in the time line, which did not include the regular operating procedures of the District concerning the ongoing daily monitoring of reservoirs and water conveyance systems, not on the overall actions taken by the District. Therefore the consulting engineer was not given the full picture of the District's response and normal operating procedures the District follows in its daily operation of the distribution system including reservoir operation, maintenance, and observation.

The District's employees inspect its reservoirs and conveyance system every fall at the end of the irrigation season and each spring prior to and as the system is filled while turning water into the system. The Unit A reservoir therefore was inspected in the fall of 2014 and again in the spring of 2015 during the filling of the distribution system and the reservoir. At that time there was no evidence or indication that there was any settling occurring anywhere within the reservoir. Once water is turned into the system and the reservoir the canal operators are at the

reservoir 4 times each day to monitor the reservoir conditions and water levels. The District keeps the daily Canal Operator Report that logs the times, conditions, and actions taken at each facility. This report is kept daily throughout the water season. If there are any indications of leaks or other conditions, they are reported immediately to a supervisor and appropriate actions are taken. Therefore the District was aware of the condition of the reservoir and there was no indication that there were any conditions that would cause a catastrophic failure.

In a conversation with the engineer from the Engineering Firm that was consulted, once it was explained to him the extent of the District's actions in responding to the underground water coupled with our normal operational procedures for system oversight, regular reservoir inspections, and monitoring of water levels and reservoir conditions he could find no fault in the District's response.

Whenever there is a leak in our system and there is any question if it is culinary or secondary, the cities always perform a Chlorine test to determine if there is Chlorine in the water, we do not perform that test. The District has used dye testing in the past with mixed results. The District was not aware of water chemical composition testing and when researched was told it is not a very effective test. The water chemical test that was performed on the water sources in this instance were more closely related to Ogden City water than to the irrigation water. We were informed that it did not entirely rule out that the District could be contributing to the ground water, therefore, the test was inconclusive. This finding was consistent with the information the District received when discussing the procedure with the individual the Auditors Office reached out to for recommendations on identifying water system leaks. The District was also informed that it was not a reliable test, generally inconclusive and does not add any information as to the location of the source of the groundwater. Consideration must also be given to the fact that there is naturally occurring ground water located in this area as well as all along the foothills of the area.

The District did all of the items listed in B, stop or slow the flow of water, which is standard in all of our leak detection analysis. The District also used the methods in C, find and fix the leak, with the exception of camera or sonar inside the pipe which requires a complete shutdown and draining of the distribution system and cutting into the pipe network to install the equipment every several hundred feet. Piezometers were also not considered because they are used more for long term monitoring of groundwater.

In response to this finding, the District is looking at additional proactive measures to inspect its pipe system to evaluate their condition and provide additional training to personnel. District management and personnel are well versed and acquainted with emergency response procedures. During this period the District consulted with other industry experts, i.e. consulting engineers and construction company personnel with expertise in the use of and various methods of dye testing and leak detection protocols.

The District executed a responsible and proven procedure to ascertain if the ground water was coming from a District facility. Each occurrence is different and some take more time to find than others. The District response was measured and responsible. The impacts on an entire

distribution system delivering water to 2,491 connections have to be carefully considered and evaluated before shutting off water to find leaks. There are many factors to consider when systematically isolating areas to find the source of a leak. Consideration must be given to the actions impact, economically and physically, on the other users and the system.

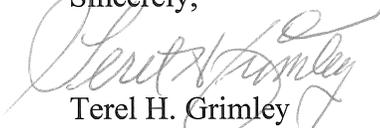
The District's one page response procedures are only for the initial action to follow when there is a leak or indications of a problem situation and is not meant to detail the follow up and identification of the source of a leak or emergency situation.

As with any difficult situation, there are lessons to be learned. The District is reviewing its response and procedures to improve its practices. In addition to those measures already indicated, the District will create and implement an Emergency Action Plan for all District facilities and conduct annual training on those procedures.

This response is on behalf of the Board of Trustees and Terel H. Grimley, General Manager.

Please contact me with any concerns or questions,

Sincerely,



Terel H. Grimley
General Manager



OFFICE OF THE
UTAH STATE AUDITOR

AUDITOR’S CONCLUDING REMARK TO DISTRICT’S REPLY LETTER

The District’s reply to our findings and recommendations (“Reply Letter” – see Attachment A) introduces new and contradicting information. For example, a press release from the District, dated July 9, 2015, stated:

*All indications are that this is ground water from the mountains to the East. As always, Pineview Water Systems has responded quickly and thoroughly to the problem **and has eliminated all possibilities we can think of** that might indicate that our system is contributing to the situation.* [Emphasis added]

The press release implies that the District had concluded their work; but, the District’s Reply Letter states that the “July [14th] Board meeting cancellation had no impact on efforts to identify the source of the water” and that “Board oversight was not needed because the district personnel **were in the investigative stages** and following proper procedures.” [Emphasis added]

During the audit the general manager told us that reservoirs are not inspected before they are filled in the spring, but the District’s Reply Letter states that they are inspected “each spring prior to and as the system is filled.” The District initially told us that the reservoir was not inspected until two days after the leak was reported, but the District’s Reply Letter indicates that “canal operators are at the reservoir 4 times each day to monitor the reservoir conditions and water levels.” We would like to note that we had previously requested all information that was newly provided in the Reply Letter.

The Reply Letter also states that the board members are “highly qualified individual[s],” but the general manager considered it unnecessary to consult them in spite of the statement in the press release that they had “eliminated all possibilities we can think of.” The general manager also indicated that there was a threat of litigation, but considered it unnecessary to advise and consult with the board during the July meeting. This indicates a lack of effective governance by the board.

We question the reliability of information that is inconsistent and provided weeks after our request. We also question why the District did not consider it important to provide us with this information weeks ago during our investigation since they now consider it to be significant and relevant information. The District’s lack of cooperation may be the result of complacency, insufficient expertise, or an intentional effort to obstruct our efforts.

Ultimately, the District’s response to the flooding and its written reply to this investigation appear consistently insufficient. The Reply Letter reaffirms the conclusion noted in Finding No. 1, “Ineffective Board Governance and Lack of Accountability.”