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To: Government Officials, Editors, Investigative Media, RIZZO Associates, Buckeye Lake Chamber of Commerce, Buckeye Lake Civic Association, Buckeye Lake Beacon, Buckeye Lake area residents, and Ohio taxpayers

Subject:

(1) The US Army Corps of Engineers Report on the Buckeye Lake Dam, March 2015;
(2) ODNR "management" of the Buckeye Lake dam, past and present; and
(3) the unfounded and irresponsible "dam failure" hysteria created by government bureaucrats.

Dear Ladies and Gentlemen:

Objective: A major upgrade to the current dam at Buckeye Lake is absolutely essential. The goal should be to design and construct a safe, cost-effective upgrade to the existing dam, while limiting the adverse impact to the environment, and the residents and businesses in the Buckeye Lake area.

First, please be advised that I have extensive knowledge and understanding relating to virtually all of the issues and conclusions set forth by the US Army Corps of Engineers (USACE) in their final report on the Buckeye Lake Dam dated March 2015. In 1997, I first became aware of the 100% PMF (Probable Maximum Flood) design standard for the Buckeye Lake dam (23.6 inches of rain in 6 hours). I immediately knew that such an extreme rainfall event would be incredibly rare anywhere in the US, except for coastal and nearby inland areas subject to flooding from large tropical storms or hurricanes. **I joined the Association of State Dam Safety Officials (ASDSO) in 1997** in order to research and understand these issues. **I have attended two ASDSO national conventions, and have maintained continuous membership since 1997.**

Regarding Buckeye Lake, I have a lakefront residence that abuts the downstream slope of the Buckeye Lake dam. My late wife and I had one of those early 1900's cottages torn down in mid-1975. **Construction of a new residence was completed by the spring of 1976. Since my father was an architect, he prepared the design plans**. My father and I were closely involved in following and supervising the construction process**. Over the years I learned a lot from him about engineering, design, and construction.**

Please note: I have included extensive documentation, reference information, and an easy to understand explanation of technical dam engineering terms such as the PMF in subsequent sections of this letter. Additional information is included in the Exhibits following this letter**.**

In the late 1990's, the ODNR (Ohio Department of Natural Resources) dam engineers were planning an expensive, destructive, and totally unnecessary reconstruction of a small dam (to meet a 50% PMF design standard) in a wilderness area of the Lake Katharine State Nature Preserve. <u>This project was strongly opposed by the Director of the ODNR Division of Natural Areas and Preserves.</u>
I worked closely with the Director and other concerned citizens regarding this plan. I even testified before the Controlling Board of the Ohio Legislature. Fortunateiy this project was scrapped.

Unfortunately, the ODNR dam engineers shortiy thereafter bulldozed thru several other wasteful, destructive, and unnecessary "dam safety" construction projects (aka a jobs bill for dam construction contractors). There was not enough citizen opposition, and the investigative media were in a total fog.

My construction related experience includes the following: (1) working with the United States Department of Agriculture (USDA) Soil Conservation Service in the design and complete reconstruction of the "failed'' embankment of a one-acre pond up to 12 feet deep, located in the Buckeye Lake dam drainage basin; (2) dealing with managing and solving drainage problems in rural agricultural areas, and (3) solving drainage, structural, and construction problems in a variety of residential rental properties.

In 2003-2004, I served on an ODNR "Value Engineering" citizens committee regarding the Buckeye Lake dam. The committee work involved extensive meetings and discussions about the dam situation.

Several years later, **the ODNR dam engineers released a stunning dam construction proposal for the West Bank area: Extend the dam embankment 20 feet into Buckeye Lake, with two new sheet pile walls, one at 16 feet and one at 20 feet. The 4 foot gap between the two sheet pile walls would be filled with concrete. The 16 foot gap between the original embankment and the first sheet pile wall would be filled with appropriate compactible dam embankment material.**

List of Topics Covered in Letter Dated June 10, 2015 from Raymond E. Karlsberger

1. **Summary of Important Facts Relating to the Buckeye Lake Dam (Exhibits 1 & 2)**
2. **Facts About the Buckeye Lake Dam Embankment**
3. **The ODNR Dam Classification System (Ohio Administrative Code Chapter 1501:21-13-01) (Exhibit 3)**
4. **Probable Maximum Flood (PMF) and Probable Maximum Precipitation (PMP)**
5. **ODNR Mismanagement of Communication Regarding Dock Construction Permits and Residential Use of Lakefront Areas (Exhibits 4 thru 7)**
6. **Issues Relating to Emergency Evacuation Plans for the Buckeye Lake Area. (Exhibit 8)**
7. **The Sellers Point Emergency Spillway**
8. **The Sellers Point Emergency Spillway and Flooding Closures of I-70 (Exhibit 8)**
9. **Dam Safety Risks and ODNR Mismanagement**
10. **Analysis of Photos in the USACE Report**
    - **Defects or Adverse Conditions NOT RELATED to the Presence of Homes Abutting the Embankment**
    - **Defects or Adverse Conditions POSSIBLY RELATED to the Presence of Homes Abutting the Embankment**
11. **Analysis of the USACE Report "Fact Sheet" and Executive Summary**
12. **Analysis of Incremental Risk in Extreme Flood Events (Exhibit 9)**
13. **Comparative Risk Analysis of the Teton Dam vs the Buckeye Lake Dam**
14. **Teton Dam Failure Timeline**
15. **Analysis of "Current ODNR Dam Safety Standards" for the Buckeye Lake Dam**
16. **Conceptual Guidelines for an Upgraded Buckeye Lake Dam**
17. **ODNR Dam Engineers Design Concept for a "New" Buckeye Lake Dam**
18. **House Buckeye Lake Caucus, Riffe Center, April 30, 2015 (Exhibit 10)**
19. **Comparative Risk Analysis for the Buckeye Lake Dam**
20. **Summary and Conclusion**

1. Summary of Important Facts Relating to the Buckeye Lake Dam

- The ODNR Division of Engineering website has a summary of important statistics for the Buckeye Lake Dam. **(See Exhibit 1, Buckeye Lake Dam Statistics, April 12, 2015).** Note the following statistics: (1) "Storage Capacity at Principal Spillway Elevation: 14,000 acre-feet" and (2) Reservoir Surface Area at Principal Spillway: 2,800 acres". Per these statistics in Exhibit 1, **the average depth of Buckeye Lake is only five feet**. (14,000 acre-feet divided by 2,800 acres equals 5 feet). Note: **An acre-foot is the volume of water that would cover one acre to a depth of one foot** (43,560 cubic feet).

- The ODNR Division of Engineering recently revised this chart. **(See Exhibit 2, Buckeye Lake Dam Statistics, May 3, 2015).** The revised entry now reads as follows: "**Reservoir Surface Area at Principal Spillway (winter pool): 2,350 acres".** A totally new entry reads**: "Current Year-Round Operational Target Lake Levei: 888.75 feet above mean sea level (winter pool)." Thanks to the dam engineering bureaucrats, the Buckeye Lake that everyone has known and loved no longer exists.**

- Per ODNR, **the total drainage area to the Lake is 44.1 square miles**, consisting of several small unnamed streams and the Kirkersville Feeder Canal. By comparison, the size of Fairfield County is 505 square miles, **so the drainage area into Buckeye Lake is less than one tenth the size of Fairfield County**.

- **Historically**, (until about the 1970s**), the Buckeye Lake dam** was not considered a dam**. it was referred to as a levee** (see USACE report, Appendix F), and note the frequent references to "the levee" and "the levee sea wall" in reports dated before 1970.

- Per an ODNR Ohio State Parks brochure, **the Buckeye Lake dam was constructed in two phases**. **The first phase ...."was not large enough to supply the necessary water for the canal so it was enlarged**. Later, in order to provide an even larger amount of water, another lake was developed ...west of the original one. A dike, known as 'Middle Wall' separated the Old Reservoir and New Reservoir. This dike was used as a towpath for the canal." This dike extended southward from the Seliers Point across the Lake to the canal entrance near the Buckeye Lake Marina on Canal Drive in Millersport.

- I understand (but have not verified) that the **Buckeye Lake Yacht Club** is the only yacht club located on any state-owned lake in Ohio. Also, the **Cranberry Bog State Nature Preserve**, is a one-of-a-kind natural area anywhere in the worid.

- The **West Bank** area of the Buckeye Lake dam extends to the north from Lieb's Island Road and then passes Mud Island. A short distance further north of Mud Island, the dam embankment turns to the east to the Sellers Point spillway. **The North Bank** of the Buckeye Lake dam extends east from the Sellers Point spillway, past the Buckeye Lake Yacht Club, to the Buckeye Lake State Park boat ramp in the Village of Buckeye Lake.

2. Facts About the Buckeye Lake Dam Embankment

The maximum height of the dam embankment is about 15 feet in the North Bank area, and about 8 feet in the West Bank area. In many areas along the lakefront, the height of the embankment is significantly less, especially in the West Bank area.

The top of the dam embankment at Buckeye Lake is about 4 feet above the normal pool elevation in the North Bank area, and about 3 ½ feet in the West Bank area. This means that **the maximum water depth against the dam in the North Bank area is about 10 or 11 feet. The maximum depth in the West Bank area is about 4 or 5 feet. In most areas along lakefront, the depth of the water against the dam is significantly less.**

The paved roadways along the embankment (SR 360, West Bank Drive, and other private roads) are a good benchmark for elevations at the bottom of the embankment. **In some areas along the lakefront, the roadway elevation is level with or above the lake level at normal pool.**

The water table level in the lakefront area has always been very high, even during hot dry summers. In fact, the Buckeye Lake area was known as the Great Swamp in early pioneer days. In periods of moderate to heavy rainfall, nominal street flooding, standing water, and drainage are problems along almost all of the dam embankment area. **Many residents have installed sump pumps and/or have diverted downspout drainage into the lake to reduce flooding and standing water in areas below the toe of the dam embankment. Drainage issues need to be taken into consideration as a part of upgrading the Buckeye Lake dam.**

3. The ODNR Dam Classification System (Ohio Administrative Code Chapter 1501:21-13-01 (see USACE report, Appendix **I**)

Per Chapter 1501:21-13-01 of the Ohio Administrative Code: "For the purpose of this chapter, **dams shall be divided into four classes, which shall be known class I, class II, class III and class IV**. The chief shall establish a dam's appropriate classification by using the following criteria as a guideline":

- The total storage volume of the dam
- The height of the dam
- The probable downstream risk in the event of "sudden failure of the dam".

The highest risk category for any one of these three criteria establishes the classification risk for any given dam.

For a **Class I dam** (potentially high risk): (1) **the total storage volume shall be "greater than 5,000 acre feet,** (2**) the height of the dam shall be "greater th**an **60 feet"** or (3) "**when the sudden failure of the dam**" would result in **"probable loss of human life"** or "structural collapse of at least one residence or one commercial or industrial business".

These dam classification standards are Administrative Rules of the Ohio Department of Natural Resources (ODNR). **These Administrative Rules can be revised or updated by ODNR at any time**. **Administrative Rules are not the same as "Ohio law", despite frequently being referred to as such by ODNR and the media. (See Exhibit 3, ODNR Dam Risk Reduction Program** and **Exhibit 4, ODNR Division of Parks & Recreation Policies and Practices)**. **Oho Laws are published in the Ohio Revised Code (ORC**), **and require approval by the Ohio Legislature and the Governor**. Further, **these standards may be similar, but they are not uniform across the U.S**. **Each state has established their own administrative rules. For example, in some states the storage volume of a dam must be greater than 50,000 acre feet (10 times the Ohio standard) to be considered a potentially high risk Class I dam.**

4. Probable Maximum Flood (PMF) and Probable Maximum Precipitation (PMP)

The usual dam engineering definitions of the PMF and PMP are as follows: (See USACE report, Appendix E, pages 6 and 9)

PMF: "The most severe flood that is considered '**reasonably possible'** at a site as a result of meteorological and hydrologic conditions" .

PMP: "Highest precipitation '**likely to occur'** at under known meteorological conditions".

The actual hydrologic and engineering calculation of the PMF is a "probable" estimate of the Maximum Possible Flood and Maximum Possible Precipitation at any given location. For example, **the 100% PMF for the Buckeye Lake area is based on a 23.6 inch rainfall event (PMP) in 6 hours.** (See USACE report, page 8) Technically, a 100% PMP/PMF rainfall/flood event is "possible" at Buckeye Lake or elsewhere in Ohio. However**, no rainfall/flood event anywhere close to such magnitude has ever happened in Ohio in 150 plus years of weather records**. Thus, the probability of such a rainfall/flood event in a 50 to 100 square mile area anywhere in Ohio is infinitesimally low, and even lower for any specific location such as Buckeye Lake. **The terms "reasonably possible" and "likely to occur" in the above PMF/PMP definitions are incredibly misleading. A much better conceptual definition of the PMF and the PMP is the "PMPF" (Probably the Maximum Possible Flood) and the "PMPP" (Probably the Maximum Possible Precipitation)**.

Extreme high rainfall events are by far the most likely to occur in coastal and nearby inland areas of the US, caused by large tropical storms or hurricanes.

An important question for the investigative media and dam safety bureaucrats regarding rainfall/flood events in Ohio is as follows: Per all available weather records in Ohio, please provide detailed information regarding any/all 6 hour rainfall/flood events in Ohio where the rainfall exceeded 10 inches in a 50 to 100 square mile area or larger.

5. ODNR Mismanagement of Communication Regarding Dock Construction Permits and Residential Use of Lakefront Areas

The ODNR bureaucracy had a variety of documents that were available at the Buckeye Lake State Park office as of Wednesday, April 20, 2015. These documents are analyzed below and are listed as **Exhibits 4 thru 7** in this report:

Exhibit 4: ODNR Division of Parks & Recreation Policies and Practices. This is a classic example of an ODNR "really fine print" information sheet. Note line 10: "**The division may, at all reasonable times and without prior notice, enter into** and upon the Structure, associated appurtenances and watercraft and **adjacent property** to determine if the Permit holder is complying with the terms of a permit, the laws governing the Lake and "**Ohio's Dam Safety Laws." Where is the statutory authority to enter "adjacent property" that is not is not public property or a public right-of-way?**

Exhibit 5: ODNR Application for a Dock Construction (or Superaqueous Structure) Permit, (Ohio Administrative Code 1501:41-12-12). This section of the Ohio Administrative Code (OAC) is titled "Dock Construction Permit Required". None of the text in this ODNR Application is contained in this section of the OAC. **This ODNR Application should read "Dock Construction Permit Required" per Ohio Administrative Code 1501.... In addition, this application also states "no electric cords or conduits may be run to the downstream side of the dam or on any other ODNR property". There is no other information regarding "patios, decks, flowers, flag poles, or any other "improvements" that residents may make on state property adjacent to the planned dock.**

Exhibit 6: ODNR Division of Parks & Recreation Seawall Construction Permit. Note that this permit application does not refer to seawall construction except in the title. References are made only to docks or other superaqueous structures. What is the purpose of this permit application? Please note also Paragraph 11 "**No mowing should be done on state land adjacent to a privately constructed dock or superaqueous structure by the dock holder, without the dock holder first submitting a mowing plan to the park manager."**

Exhibit 7: Information Sheet For Realtors And Brokers Surrounding Buckeye Lake. The text of this document includes the following: "All docks, public and private are regulated by Ohio State Parks.... Docks located on the Buckeye Lake dam (West Bank and North Bank) have additional restrictions (the resident is part owner of the dam). **No improvements are permitted on state property: the dam (patios, decks, landscaping, trees, etc.)"**. **Note that this document is specified for "Realtors and Brokers". Where is the information sheet for homeowners abutting the dam along the lakefront? It doesn't exist**.

Guess what YOUR tax dollars are now being spent for? In early May ODNR dam engineering bureaucrats walked along the lakefront and took photos and measurements of small flower beds (with some annuals and perennials) and even flag poles that have been there for many decades. Are the dam bureaucrats planning to demand the removal of small flower beds, flag poles and other inconsequential items from the top of the dam embankment? This is an astonishing example of an out-of-control government bureaucracy at work.

What about establishing reasonable standards for the use of the lakefront? No walkways, small scale landscaping, small patios, flower beds, small shrubs, or flagpoles--not OK. No large wood decks, large shrubs, or large landscaped areas that obscure the embankment--OK. **When the dam bureaucrats are finished with their "no nothing on the dam embankment" agenda, they will have totally destroyed the current charming ambience of the lakefront in this area.**

6. Issues Relating to Emergency Evacuation Plans for the Buckeye Lake Area

Last summer emergency **Evacuation Route** signs started appearing along highways north and west of the Buckeye Lake dam embankment. **What better evidence is there of an agenda to scare the public regarding very unlikely safety risks in the area. Note the evacuation sign posted at the westbound SR 79 intersection with SR 37**. **(See Exhibit 8, "Evacuation Route" Highway Sign at SR 79 and SR 37).** This intersection is on SR 37 about one mile south of the I-70 interchange. The sign tells drivers to make a left turn across a busy state highway (SR 37)—not a safe idea for possible heavy traffic volumes. **Even worse, the Kirkersville feeder canal crosses SR 37 less than a mile south of this intersection. This area would likely experience major flooding in an unprecedented storm event**. Conclusion: Another example of bureaucratic incompetence from a government agency.

Regarding emergency evacuation drills, **it is obvious that the primary objective of the dam safety bureaucracy is to continue to scare the public about greatly exaggerated safety risks.** There was extensive newspaper and TV news coverage of the first evacuation drill. **Unfortunately, the media spends way too much time chasing ambulances and police cars, and not nearly enough time doing real investigative reporting on real issues in the Buckeye Lake area and elsewhere. The Buckeye Lake Beacon is a notable exception. The Beacon has done extensive coverage of the Buckeye Lake dam situation for weeks.**

7. The Sellers Point Emergency Spillway

Prior to the completion of the Sellers Point Spillway in 1992, Buckeye Lake in effect served as a flood control reservoir and thereby reduced peak level flooding in downstream areas. The old "primary spillway" did not have the capacity to prevent a significant rise in lake levels, which occurred during extreme flood events in 1968 and 1990, as discussed in the USACE report.

The Sellers Point spillway was a very necessary and appropriate dam safety improvement, and it has served this purpose well. It is my understanding that the Sellers Point Spillway was designed to prevent overtopping of the existing dam up to a 50% PMF flood event (a flood that has probably never occurred anywhere in Ohio in the past 150 years).

After 1992, flood water coming into Buckeye Lake (from storm events comparable to 1968 and 1990) would immediately pour over the Sellers Point Spillway. There would be no significant rise in lake levels. The USACE report and analysis totally ignores the purpose, function, and effectiveness of the Sellers Point Spillway. The report also ignores the corresponding dramatic reduction in the likelihood of "potential failure modes".

Further, per a recent Article in the Columbus Dispatch regarding the first gathering of the Ohio House Buckeye Lake Caucus, the Director of the Ohio EMA "explained that the state has reduced the volume of water in the lake by 56 percent, giving the lake a three foot buffer to absorb a heavy rainstorm without fear of overtopping. That's a huge factor of safety**". The obvious conclusion: another government bureaucrat who repeats the irrelevant, misleading, and canned talking points from the USACE report.**

The only adverse result after completion of the spillway was the greatly increased frequency and the severity flooding in downstream areas. The new outlet channel below the spillway was totally inadequate, resulting in increased flooding of nearby homes and businesses downstream from the dam. **Outlet channel improvements below the spillway have just been completed, more than 20 years late.**

8. The Sellers Point Emergency Spillway and Flooding Closures of I-70

Interstate 70 at the SR 79 interchange has been closed countless times from flooding since it was completed in the late 1950s. The first major closure was during the 1959 flood in central Ohio. It is obvious that **I-70 in this area was not constructed above the 100 year flood plain—a very minimum standard for major highway construction. The frequency of flooding closures greatly increased since the new Spillway opened in 1992. The flooding closure frequency problem became so bad in the last 5 years, the state government bureaucracy (ODOT) had to do something. The ''solution'' to the problem was to post I-70 detour signs for traffic coming from I-70 in the Buckeye Lake area. For areas south of I-70, I-70 detour signs are posted at the SR 37 and SR79 intersection for travel in both directions**. (See **Exhibit 8, I-70 Detour Signs at SR 79 and SR 37)**. Comparable detour signs are also posted along US 40 for I-70 detour traffic. **The objective was to avoid having to post so many detour signs every time I-70 had to be closed due to flooding. Problem "solved".**

The USACE report totally ignores the current flooding problems and frequent closures of I-70 because of ODOT design deficiencies.

An important question for investigative reporters and ODOT bureaucrats: What plans are there, if any, to reconstruct I-70 above the 100 year flood plain in the SR 79 interchange area? If not now, when, if ever?

9. Dam Safety Risks and ODNR Mismanagement

The USACE report has totally ignored the many years, even decades, of ODNR mismanagement of the Buckeye Lake dam. Examples of problems that developed, and no ODNR solutions include the following:

1. **Small sinkholes on the top of the embankment, mostly close to the masonry wall in the West Bank area of the lakefront.** These sinkholes are caused by major deterioration of the masonry wall and also the sheet pile wall. **Wave action would wash water thru holes in the deteriorating wall, and then water would wash back out, carrying the embankment fill back out into the lake, causing the sinkholes.** For years, lakefront residents would notify the state park office regarding the sinkholes, and rarely would repairs be made. Some residents would even try to fill the holes themselves.

2. **Masonry wall sections that have had major displacement off of the supporting concrete wall.** For years, the ODNR bureaucracy has never bothered to make any repairs in the few such areas along the dam. I understand that the West Bank resident with the most severe masonry wall displacement has documented evidence of meeting with ODNR officials regarding this problem in **2005** and again several years later. **ODNR finally "fixed" this problem on April 18, 2015, by dumping a 12 cubic yard SxxxPile of concrete in front of the center of the displaced wall section.**

3. **"Trees rooted in the embankment". The ODNR dam (stupid) engineering solution to this problem is stunning: (1) cut down numerous trees along the top of the embankment. (2) Since the dam engineering handbook says that tree stumps and roots can deteriorate over many years, come back in a timely manner and stump grind out the entire stump and root system. And then, drum roll please, (3) leave very large holes in the top of the dam embankment filled up with ground up sawdust, wood chips and topsoil. Then, never bother to clean out and backfill the holes with appropriate compactible materials for the top of an earthen dam.**

   The USACE dam (stupid) engineers have totally ignored this "defect" in their report on the Buckeye Lake dam.

The obvious conclusion: The ODNR bureaucrats and their mismanagement have encroached on and damaged the integrity the Buckeye Lake Dam far more than lakefront residents have with patios, decks, landscaping, drainage systems, "utilities" (aka underground electric conduits), flag poles, flowerbeds, and whatever else the dam safety bureaucrats don't like. The obvious strategy: Blame the homeowners for almost all of the "dam safety risks", and ignore ODNR mismanagement, and the major deterioration in the condition of the concrete/masonry wall and the sheet piling along the dam. See the USACE report, Executive Summary, Page III: **"site reconnaissance… efforts resulted in the determination that numerous defects, of which the most significant are many encroachments by private interests, exist along the entire 4.1 miles of embankment at Buckeye Lake."**

10. Analysis of Photos in the USACE Report (Appendix C)

Defects or Adverse Conditions NOT RELATED to the Presence of Homes on the Embankment.

Per the USACE report, Executive Summary, (page III): "Embankment defect conditions observed during the 2014 site reconnaissance included sheet pile and masonry wall deterioration, trees on the embankment...."

- **Photo 26 on Page 14.** This former home (located near the Sellers Point Spillway) was severely damaged by a fire that started on the roof about 2 AM in the early morning of July 4, 2014. My understanding is that the likely cause was fireworks residue that landed on the roof and eventually started the fire. The home was torn down to the foundation several months after the fire. **The "redundant concrete walls" on the left side of Photo 26 are part of the masonry wall system that supported a fireplace on the main level of the home. The USACE statement that these "redundant concrete walls" were "most probably due to seepage related displacement and distress along upstream wall" illustrates a totally incompetent analysis by the USACE dam engineers.**

  Furthermore, **the distance from the lakefront sheet pile wall to the basement wall is 30 feet.** The height of the basement wall at the fireplace location is 8 feet. The normal summer pool level of the lake is about 4 feet below the lakefront wall**. Thus, the normal summer pool of the lake is only about 4 feet above the basement floor elevation. Clearly, draining the lake level to winter pool levels for alleged high-risk conditions like this is unnecessary and irresponsible**.

  There was also another residence abutting the embankment (in the West Bank area) that had major damage from a fire that started about 8 AM on July 5, 2014. This home was on the Buckeye Lake Historical Society Tour of Homes several years ago. Major reconstruction of this home is now nearing completion.

- **Photo 22 on Page 12. The USACE report describes "settlement along a sidewalk behind eastern training wall at Sellers Point spillway**". This spillway was designed and built by ODNR approved dam engineers and contractors. **Minor settlement in a back-filled area along the side of the spillway is totally irrelevant to the safety and structural integrity of this spillway. Further, minor settlement issues close to the foundations of homes abutting the dam embankment are also not a dam safety issue.**

- **Photo 21 on Page 12.** "**View from west side of Sellers Point Spillway. Note the large amount of eroded material deposited along the east training wall."** The so-called large amount of material would fill no more than two wheelbarrows from the garage of a typical suburban home. Occasional relatively high water flow rates below the spillway could easily cause backflows along the sides of the spillway apron, especially since the downstream channel narrows significantly within a short distance downstream. This backflow could easily leave a small deposit of eroded material "along the training wall". **This illustration is totally irrelevant to the safety and structural integrity of the dam spillway. Another incompetent analysis by the USACE**.

- **Photos 10 and 11**. "Lagoon behind western embankment intercepts flow from reservoir through a steel pipe with no flap gate." This "Lagoon" is in fact a farm drainage pond for drainage of a large farm field surrounded by the dam embankment on the east, Liebs Island Road on the south, Millersport Road on the west, and Ballards Lane on the north. The drainage system includes a pump house to pump water from the pond into the lake after heavy rainfall runoff into the pond. There is no water flow from the reservoir. The water flow is to the reservoir. **Another incompetent analysis by the dam engineers at the USACE.**

- **Photos 1,13,14,15,28, and 34.** Sheet pile and masonry wall deterioration along the lakefront and/or poor ODNR maintenance in these areas. **The poorly maintained front section of the sheet pile wall in Photo 1 is at the beginning of the State Park area just north of Liebs Island road.**

- **Photo 3**. Typical erosion thru the deteriorated masonry wall caused by wave action against the wall.

- **Photos 4,19,32,37, and 42.** Sinkholes on the top of the embankment that have rarely been repaired by ODNR. Regarding the small tree growing out of the masonry wall in Photo 19, this is an ODNR maintenance issue.

- **Photo 5**. "Typical settlement feature observed by the masonry wall along the west embankment." **This settlement is caused by wave action erosion thru the deteriorated masonry wall.**

- **Photo 8 on Page 4, Photo 8 on Page 5, and Photo 19.** Large trees on the embankment. **Note: On pages 4 and 5 there are 2 photos marked "Photo 007" and 2 photos marked "Photo 008". This is an example of careless and sloppy report preparation. Trees on the embankment are an ODNR maintenance issue.**

- **Photo 31. "Damaged waler on top of sheetpiling". This is an ODNR maintenance issue.**

Defects or Adverse Conditions POSSIBLY RELATED to the Presence of Homes Adjacent to the Embankment.

- **Photo 6 and 25.** Drainage pipes through the masonry wall (Photo 6) and through the sheet pile wall (Photo 25). **Most pipe penetrations (such as Photo 25) are within about a foot of the top of the embankment. Both pipes are above the normal pool and pose absolutely no risk for embankment failure for the dam at and up to two feet above normal pool.** Note that these drain pipes would flow downhill towards the lake in order to drain properly. Thus**, it would take lake levels above the pipe outlets to backflow through them. Such backflow with non-existent hydrostatic pressure to drive erosion thru the embankment is not a dam safety risk.**

- **Photos 41 and 44.** New residential construction. Both homes appear to be quality construction. Note that the new home in Photo 41 has very little encroachment on the downstream side of the embankment. The concrete wall in Photo 44 appears to be a significant distance from the lake wall. Supported excavations should not be necessary in most cases. For example, when the width/height ratio of the dam embankment relative to the elevation distance below normal pool is at least 4 to 1. For instance, a 25 foot embankment width with a 5 foot drop from normal pool to the basement floor should not need a supported excavation.

- **Photo 7 (on page 4) and Photo 36. The minor cracks shown are irrelevant structural issues**. The cracks in the masonry wall in Photo 36 are only on the top row of block, likely caused by temperature related expansion/contraction in the attached wood deck above.

- **Photo 8. *"Structure exhibiting distress…".*** Need more information and a better photo to evaluate. The embankment appears to be solid with a likely four to one width-depth ratio.

- **Photo 9.** The concrete block wall appears to be in fair condition. The pilasters help to provide additional support. More information is needed to evaluate, such as the condition of the embankment and the embankment width/depth ratio.

- **Photo 12**. Wood decks. Large wood decks should be removed at the time the dam upgrade is constructed.

- **Photo 16.** This boathouse is an historic structure that has been there for at least 100 years. **The downstream area at the toe of the dam embankment in this area is about level with the lake at normal pool**.

- **Photo 17.** "Failing concrete block wall". Why is the width of the image cropped? The failing wall does not appear to be a structural element supporting the downstream embankment. A better image should be have been included or leave it out of the dam report.

- **Photo 18.** "Excavation into downstream face of embankment.....". Additional information would be helpful to evaluate this location, such as (1) the condition of the remainder of the embankment, (2) the elevation difference between the lake at normal pool and the bottom of the embankment, and (3) the width/depth ratio as discussed above.

- **Photo 24.** "Note that the sidewalk is misaligned with structure indicating embankment displacement". **The concrete stairway shows minor settlement**, which is common in backfilled areas in residential construction. **Note that the stairway is not misaligned with the structure**. **The apparent "misalignment" in the lower left corner of the photo is obviously just a small missing brick between the concrete ledge and the vinyl siding**. **Another incompetent analysis by the USACE dam engineers.**

- **Photos 29 and 35.** Both dock structures are supported by a vertical steel beam buried in a large concrete footer buried into the embankment**. These dock structures are not supported by the sheet pile walls. This dock design is not a dam safety risk. Obviously, this type of dock support system should not be approved for an upgraded dam wall.** The dock shown in Photo 35 should be reported as a "public health risk," since the neighbors are probably sick of looking at such an unsightly contraption.

- **Photo 30.** The settlement in the sidewalk area next to the house is most likely caused by poor backfill in the excavation area next to the house and the concrete retaining wall. **The cross-section high point in some North Bank areas is between the lakefront and the sidewalk that parallels the lakefront. A gradual slope downhill from the sidewalk toward the homes is not uncommon in such areas.**

- **Photo 33.** Note how wide the dam embankment is in this area of the lakefront**. # 57 gravel (it is not called # 57 stone)** is OK as a drainage material in this application. **Note the quality of the retaining wall being constructed by the adjacent homeowner, compared to the unsightly and unsafe exposed sheet pile wall in the Buckeye Lake State Park area north of Liebs Island Road (See Photo 1.)**

- **Photo 40.** "Failing concrete wall built into the downstream embankment slope…" **The failing concrete block wall is not a structural element designed to support the downstream embankment**. This wall is therefore not a dam safety risk.

11. Analysis of USACE Report "Fact Sheet" and Executive Summary

The USACE Report "Fact Sheet" and Executive Summary contain a stunning laundry list of incorrect, misleading, and inflammatory allegations:

1. **USACE Allegation:** (Fact Sheet, page 2) **"Approximately 3,000 people live within the projected dam-failure inundation zone and, if the dam were to break, face the potential of being hit by up to an 8-foot wave of water, mud, and debris."**

Fact: Using a real world example, if a 30-foot high levee along the Mississippi Rivers fails, a large flat field would not face a 30-foot high "wave of water, mud and debris**". In a flat downstream area, the flow from a breach quickly flattens out (attenuates) . The velocity and height of the flow quickly decreases as the flow moves forward spreads out across the field.**

2. **USACE Allegation**: (Executive Summary, page IV) "...prior near failures....at and above normal pool.."

Fact: There have never been any "near failures" at normal pool. A repeat of the 1968 and 1990 fiood events would not result in a significant increase of flood levels in the lake since flood waters would immediately pour over the Sellers Point spillway into downstream areas. (See also Allegation # 4 below).

3. **USACE Allegation**: (Executive Summary, page IV) "Potential failure modes include internal erosion of the embankment fill".

Fact: The high hydrostatic pressure to drive such a potential failure does not exist at Buckeye Lake.

4. **USACE Allegations:** (Fact Sheet, page 2) . "**The water level should remain at a lower 'winter pool' level to...provide more storage space during periods of excessive rainfall."** (Executive Summary**,** page 4): **"...the likelihood of dam failure is high based on prior near failures at and above normal pool...**and requirements on several occasions for emergency response actions to prevent breaching."

Fact: The USACE report totally ignores the purpose, function, and effectiveness of the Sellers Point spillway, which was completed in 1992. The USACE report implies that a repeat of the 1968 and 1990 flood events would result in an "emergency response action" to prevent breaching. In fact**, a repeat of the 1968 and 1990 flood events would not result in a significant increase of flood levels in the lake.** Since the completion of the Sellers Point spillway in 1992, there has never been potential near failure. Also since 1992, there has never been a significant rise in the level of Buckeye Lake to cause any kind of possible failure situation. **The probability of a flood event approaching or exceeding a 50% PMF design standard is infinitesimally small.** Further, **"more storage space during periods of excessive rainfall" is not needed, since any "excessive rainfall" amounts will immediately pour over the spillway to downstream areas. The Buckeye Lake dam was not planned, designed, or ever intended to be used as a flood control reservoir.**

5. **USACE Allegation:** (Fact Sheet, page 1). "**Portions of the dam have been dug away to accommodate pools and patios, utilities and drainage systems for the structures that are built into the dam."**

Fact: Pools. What kind of ''pools'' and where are they located? **There are no private pools dug into the embankment**. I only know of one above ground pool on private property. It is located well behind the dam embankment. Further, **the elevation of the paved roadway in this area is level with or above the lake at normal pool.**

Patios. Portions of the dam have been dug away to accommodate...patios? **The construction of a patio on the top of the dam embankment does not involve "digging away a portion of the dam".**

Utilities. What kind of utilities? The USACE dam engineers are probably referring to small electric conduits for **outdoor lighting to provide safety and security for residents along the lakefront**.

Drainage systems. The USACE dam engineers are most likely referring to **4-inch diameter drain outlets into the lake for downspouts and sump pumps**. Most of these drain outlets are located within a foot or less of the top of the embankment. **Many of these outlets have been there for decades.** A 4-inch diameter drain line near the top of the embankment is irrelevant as a significant safety risk to the dam.

6. **USACE Allegation**. (Fact Sheet, page 2). **Options listed in the USACE Report include "to drain the lake permanently" or building a new dam to "replace the failing dam with a new structure**."

Fact: Regarding draining the lake, did the USACE dam engineers recommend draining the Mississippi River or draining the Gulf of Mexico permanently as a risk reduction option for the flooding problems in the New Orleans area? For a "Smart Public Policy" alternative to **building a new dam** please refer to Section 16 of this letter: "Conceptual Guidelines for an Upgraded Buckeye Lake Dam".

7. **USACE Allegation**: (Executive Summary, page III) "Embankment defect conditions include "...trees rooted in the embankment..."

Fact: **The ODNR dam safety bureaucracy** is totally responsible for managing the trees on the top of the embankment. To the extent that such trees are a dam safety risk, the responsibility for **properly** removing trees located on state property lies with ODNR, not the residents.

12. Analysis of Incremental Risk in Extreme Flood Events

In many extreme or catastrophic flood events, the damage from the actual failure or potential failure of a dam is relatively small compared to the damage that is actually done by the flood. Examples are as follows:

1. In the Columbus area, March 1913, during the infamous 1913 flood: **(See Exhibit 9, The Day the Dam Broke, by James Thurber) "...it was during that frightful and perilous afternoon in 1913 when the dam broke, or, to be more exact, when everybody in town thought that the dam broke...The west side was, at the time of the dam scare, under thirty feet of water - as indeed, were all Ohio river towns during the great spring floods... Later, when the panic had died down...., city engineers pointed out that even if the dam had broken, the water level would not have risen more than two additional inches in the West side."**

2. **Major flooding in the Mississippi River Valley,** in 1993: I remembered a news clip of Jym Ganahl, meteorologist, from WCMH-TV standing in front of a large flooded area close to the Mississippi River. As I recall, he said that the **flood water levels along the river were so high that flood waters on the downstream side of the Lock and Dam (at Quincy, Illinois) were just as high as flood levels behind the dam on the upstream side**. Per a phone call to Mr. Ganahl on April 28, 2015**, "the entire dam was covered by the flood waters. The only evidence of the dam location was unusual turbulence in the river above the actual dam location."**

3. Per a dam research memo that I wrote in 2003, regarding the Buckeye Lake Dam, I stated, "In any design flood that would reach or overtop the existing embankment, **unimaginable flooding would occur on the downstream side of the embankment.** Every home on the West Bank would be flooded out. Per a Fuller Mossbarger report, **for a 100% PMF flood, the flood level of the South Fork of the Licking River at Sellers Point would "rise above the spillway crest (892.2 feet)...." Further, "...significant attenuation of flood peaks occurs in these flat, broad floodplains."**

For the Buckeye Lake area, the volume of water in a 100% PMF flood event (23.6 inches of rain in 6 hours) in a 100 square mile area around Buckeye Lake would be about 9 times the volume of water in the lake at normal pool. In such a catastrophic flood, downstream at-risk areas below the dam would have been evacuated (because of extreme flooding) long before any potential dam failure. Under these conditions, the probable loss of life from a dam failure would likely be zero.

13. Comparative Risk Analysis of the Teton Dam vs the Buckeye Lake Dam.

The Teton Dam is in located in Idaho, east of the city of Rexburg and west of the Grand Teton Mountains in Wyoming. The Teton Dam is 305 feet high (think of a 30 story building). **The dam failed mid-day on June 5, 1976, more than 48 hours after unusual seepage and water flow was first observed coming thru the front of the dam embankment. The failure occurred while the dam was first being filled after most construction was completed. The water level was approaching normal pool.** Significant seepage flow and very high hydrostatic pressure pushed through a developing underground channel adjacent to the base of the dam. The failure site was from a poorly designed and constructed interface between bedrock and the embankment backfill. I knew about this dam failure more than 30 years ago. **I went to the Rexburg area and the actual dam site in the late 1980s on one of my trips through the western U.S.**

You can now visit the dam failure site via Google. **If you do, look carefully at the aerial photos to see a large bulldozer on the embankment slope attempting to backfill the developing failure. The large bulldozer looks like a toy tractor that young children drive around in the driveway.**

Consider the following factors when evaluating the comparative risk of the Teton Dam failure vs the Buckeye Lake dam.

- **The height of the Teton Dam was 20 times greater than that of the Buckeye Lake dam** (305 feet vs about 15 feet).

- **The possible maximum water depth behind the Teton Dam was more than 20 times that of Buckeye Lake** (250 feet vs about 11 feet).

- **The storage capacity of the reservoir in acre-feet was nearly 20 times the storage capacity of Buckeye Lake at normal pool.**

- **The massive water flow through the breach at the Teton Dam did not wash out the entire dam embankment, only the comparatively narrow section where the breach occurred.**

- **The height/depth of the flow from the breach decreased very quickly and significantly as the flood flow proceeded downstream.**

- **The initial velocity of the flood flow was dramatically increased by the approximately 400 foot elevation drop in the Teton River Canyon before the flood entered the flat valley areas downstream. Note that the areas below the Buckeye Lake dam embankment are almost as flat as the deck of a U.S. Navy aircraft carrier.**

- **The population of the Rexburg, Idaho area at the time of the failure (about 15,000) was much greater than the Buckeye Lake area** between the dam and I-70 and nearby areas along the south fork of the Licking River further downstream.

- **The very high hydrostatic pressure at the Teton Dam site (that drove the failure) does not exist at the Buckeye Lake dam. It is like comparing the flow from a small garden hose at low pressure to the flow from a large high-pressure fire hose at a major fire.**

14. Teton Dam Failure Timeline

On Wednesday, April 29, 2015, I spoke at length by phone with the curator of the Teton Flood Museum in Rexburg, Idaho. The Teton Dam failed on June 5, 1976. She summarized the failure scenario as follows:

- Thursday, June 3: A small clear water flow from the front of the dam was first observed.
- Friday, June 4: A larger clear water flow was observed.
- Saturday, June 5, 7 AM: The water flow rate had increased significantly and the water flow had turned brown. This was an obvious indicator of a potential dam failure scenario. Later that morning, efforts to backfill the expanding outflow area with at least 4 large bulldozers were unsuccessful.
- Saturday, June 5, 10:45 AM: **Emergency alarms were sent to Rexburg and all smaller communities and farming areas downstream from the dam.**
- **Saturday, June 5, 11:57 AM: The actual time of the dam failure.**
- Saturday, June 5, 12:10 PM (estimated approximate time): A twenty foot high flood wave, travelling at 65 miles per hour, poured out of the bottom of the Teton River canyon into flat agricultural areas. The high speed of the flood flow coming out of the canyon was powered by a 400 foot drop in elevation (think of a 40 story building). **The velocity of the flood wave decreased very quickly after entering and spreading out over flat agricultural areas.**
- Saturday, June 5, 1:30 PM: The flood wave reached Rexburg about 1 ½ hours after the initial failure.

The height of the flood wave decreased quickly as the flood progressed downstream, at first thru the Teton River canyon, and then beyond, summarized below:

- 60 feet at the beginning the Teton River canyon below the dam.
- 20 feet at the bottom of the Teton River canyon.
- 10 feet when it reached Sugar City.

- 7 feet when it reached Rexburg.
- 4 feet when it reached the Snake River.

The result of this disaster:

- **More than $1 Billion in property damage.**
- **11 fatalities.**

I asked the curator how could there be such a low number of casualties given such an incredible disaster. The answer**: "Everybody helped everybody" to spread the alarm and quickly evacuate everyone to higher locations above potential flood areas**.

15. Analysis of "Current ODNR Dam Safety Standards" for the Buckeye Lake Dam

Per the USACE Fact Sheet, page 2 , "0DNR's options include...replacing the failing dam with a new structure that meets current dam safety standards". Specifically, what are the current ODNR dam safety standards for the Buckeye Lake dam?

- Option 1: The 50% PMF design standard which the Sellers Point spillway was designed to meet.
- Option 2: Upgrade to a 100% PMF design standard which the ODNR dam engineering bureaucrats will tell you is required for "public safety".

What the dam safety bureaucrats won't tell you is that the probability of such a "100% PMF" flood event (that has never happened anywhere in Ohio in recorded weather history) is infinitesimally small. Where is their statistical probability analysis? **What the dam bureaucrats also won't tell you is the added cost in millions of dollars wasted to meet such a standard for a very small dam**.

A comparable design standard from the ODNR dam engineering bureaucrats for all school buildings in Ohio would be as follows: Every public building in Ohio must be designed and constructed to withstand the "MPT" (Maximum Possible Tornado), otherwise "thousands of lives are at risk".

The use of an extreme 100% PMF design standard may be reasonable for a "big dam" such as the Teton Dam in Idaho or, "really big dams" such as Hoover Dam and the Glen Canyon Dam (on the Colorado River), or the Grand Coulee Dam in the state of Washington. I have been to all three of these dams. **The use of such an extreme design standard is totally unnecessary for a "really small dam" such as Buckeye Lake.**

Further, if the top of the Buckeye Lake dam upgrade is established at a consistent elevation no higher than 895.5 feet, any flood that could overtop the dam would be spread out along a four mile long embankment. This would result in inconsequential flow rates compared to a typical dam.

16. Conceptual Guidelines for an Upgraded Buckeye Lake Dam [Smart Public Policy)

1. **Install a new steel sheet pile wall 2 to 4 feet in front of the existing sheet pile wall: (2 to 3 feet in the west Bank area and 3 to 4 feet in the North Bank area).**

2. Consider and evaluate using highly rust resistant sheet piling, such as stainless steel, galvanized, or other composite or rust resistant products, as available and cost effective.

3. **Fill the 2 to 4 foot gap between the existing wall and the new sheet pile wall with concrete. This would make a solid new sheet pile and concrete dam along the entire embankment.**

4. Use prefabricated steel reinforcement and anchoring systems as much as possible in the new concrete dam area per established engineering guidelines.

5. **Use the existing sheet pile and concrete/masonry wall as the downstream form for a new concrete dam. This avoids the substantial cost of installing a second sheet pile wall along the entire dam embankment**.

6. Remove any severely misaligned masonry wall sections in the West Bank area and install appropriate concrete forms. This will in effect widen the concrete dam by a foot or more in such areas.

7. Locate existing small drains in the dam embankment. Backfill the state owned portion of these drains with an appropriate fill material. **Install new drainage lines to the lake to replace any existing lines taken out of service.** Such replacement lines could be 4-inch diameter Schedule 40 PVC buried about 4 inches below grade up to the new concrete dam section. Such lines could then go over the top of the new concrete/sheet pile section. If properly designed at the upstream end, hydrostatic pressure from existing downspouts and/or sump pumps could drive the drainage flow over the concrete/sheet pile wall section into the lake. Other possible drainage options should also be evaluated.

8. **The top of the new dam embankment should be at a consistent level elevation no higher than 895.5 feet.**

9. All sheet pile work should use new vibration installation technology, and not use older “sledge hammer” pile driving equipment.

The advantages of this proposed design concept include the following:

1. All sheet pile work could be done from barges in the lake, as soon as the lake is returned to near normal pool.

2. The cost of installing a second sheet pile wall is eliminated.

3. Concrete for the new dam could easily be pumped to the appropriate sites from public roads as is currently done in many major construction projects.

4. **The cost and negative impact of hauling and dumping an incredible number of truckloads of dam backfill material for a 16 foot or wider dam backfiil area would be eliminated.**

5. **The total project cost and construction time period would likely be considerably less.**

Important follow-ups for 2015:

1. Allow Buckeye Lake to fill to one foot below normal pool ASAP, and allow the lake to remain at that level in season.

2. ASAP, in the fall of 2015: Fill all sinkholes along the top of the embankment within an appropriate mix of concrete to flow into sinkholes and possible hidden voids. This work could be done quickly and at reasonable cost by pumping concrete from a barge that would travel along the lakefront. This work cannot be done efficiently if the lake level is left at the current so-called winter pool level.

17. ODNR Dam Engineers Design Concept for a "New" Buckeye Lake Dam

No information has been released from ODNR or any other government source regarding the design concept for a new Buckeye Lake Dam other than a frequently stated project cost of $150 million. An expenditure of $150 million for a 4.1 mile long embankment equals $6,929 per foot ($150 million divided by 21,648 feet), or nearly $700,000 for a 100 foot section of a "new dam".

To give an example of comparative construction costs, **the cost of the concrete for a 100 feet long, 4 feet wide, and 12 feet high section of a concrete dam wall at $100 per cubic yard is only $17,780:** (length X width X height, 100 X 4 X 12 = 4,800 cubic feet, divided by 27 = 177.78 cubic yards, X $100 per cubic yard = $17,780).

Attention investigative reporters: <u>What is included in this cost estimate? What kind of a dam project is being considered for such a large expenditure of taxpayers dollars?</u> Or was this number ($150 million) computed by the **SWAG Method (Stupid Wild Axx Guess).** This term is sometimes used in the real estate appraisal business in reference to the authenticity of an appraisal.

The last dam engineering proposal that I have seen for the Buckeye Lake Dam is outlined as follows:

1. Extend the new dam footprint 20 feet out in the lake from the existing wall.
2. Put two new sheet pile walls 16 and 20 feet out from the embankment.
3. Fill that 4 foot section with concrete.
4. Backfill the first 16 feet from the embankment with appropriate backfill material.

The dam safety engineers and bureaucrats are likely still riding this horse, or possibly something even more extreme.

<u>Any such extreme design and construction plan wastes tens of millions of taxpayer dollars</u>. <u>What is the objective here? (1) To complete a cost effective, minimally disruptive, and comparatively easy to construct solution to the Buckeye Lake Dam problem, or (2) to do a big dam contractors jobs bill, at the expense of Ohio taxpayers, and thousands of residents and hundreds of small businesses in the Buckeye Lake area.</u>

18. <u>House Buckeye Lake Caucus, Riffe Center, April 30, 2015</u>

Examples of ODNR "Communication" to Legislators and the public (**See <u>Exhibit 10</u>**) are as follows:

1. Question: **"Would a child in Buckeye Lake Estates that was told that an 8 ft Wall of Mud and Water was coming down the road not be fearful? Since the water level is below Winter Pool, could we not tell the public what really might happen?**" Answer (ODNR Director): "**<u>An 8 foot wall of water is a reality</u>. All Winter Pool does is insure there is no leak in the dam"** REK Comment: **ODNR officials are just repeating unfounded canned talking points from the USACE Report. <u>An "8 foot wall of water" in Buckeye Lake Estates could only be caused by a tsunami. The ODNR dam bureaucrats must think "Buckeye Lake" is actually "Buckeye Ocean".</u>**

2. Question: "**The timing of the announcement that the lake level would remain at Winter Pool is such that people cannot get to their boats on lifts and covered docks. This is a serious loss of personal property for these people.**" Answer (ODNR Director): "**If the mud dries, ODNR will <u>help</u> get other equipment in to help get out the stranded boats."** REK Comment**: This is an unbelievably incompetent, stupid answer**. Isn't it a crime to seize personal property without due process or compensation?

3. Question: "**The marinas have ordered stock for a normal boating season that now is not needed. Any ideas how to help the marinas?"** Answer (ODNR Director): **The ODNR Assistant Director is looking into federal funds for help.** REK Comment: **Nothing like looking for a federal bailout for incompetent management decisions**. **Hey, state government bureaucrats, pay up.**

4. Question: "**When did ODNR get the report from the USACE engineers?"** Answer (ODNR Director): **"It is not important when we got the report."** REK Comment**: Tell the public when you first got a draft copy and final copies of the dam report. Why can't the government bureaucrats answer the question? What are they hiding? It must be something that they don't want the public to know.**

5. Question: "**Why can't the weak spots on the dam be fortified and the water level raised as work begins on the dam?"** Answer: "**It's a dam system. All need to be replaced**." REK Comment: **Why do the job in a cost effective manner if you have $150 million to spend**.

6. Question: **"There have been several dam reports since the 1990's. Why has the cost risen from $7 million to $150 million?"** Answer (ODNR Deputy Director) : **"Don't know. Inflation possibly... I was not in ODNR Parks then**." REK Comment: **Don't confuse me with the facts**.

For additional "information" from ODNR government bureaucrats, see **Exhibit 10, House Buckeye Lake Caucus, Riffe Center, April 30, 2015** (reported by the Buckeye Lake Area Civic Association)

19. Comparative Risk Analysis for the Buckeye Lake Dam.

The height of a dam is an essential part of evaluating comparative risk. The Ohio dam classification system based on the height of the dam is as follows:

- **Class I Height greater than 60 feet**
- **Class II Height greater than 40 feet.**
- **Class lll Height greater than 25 feet**
- **Class IV Height of 25 feet or less.**

In the Ohio Administrative Code a dam must be more than 60 feet high to be considered a Class I (potential high risk) dam based upon height criteria. Per the OAC, a dam with a height of 25 feet or less would be placed in Class IV (very low risk), based upon the height criteria. In other words, **the dam classification of the Buckeye Lake dam would be in the very lowest risk category if the classification system was based on height alone.**

An excellent way to judge the risk from a potential dam failure is to analyze the modes of failure and the risks associated with an actual dam failure. Let's use the Teton Dam failure as an example. To summarize, **the Teton Dam is 20 times as high as the Buckeye Lake Dam (305 feet, think of a 30 story building), it had nearly 20 times the storage capacity and 20 times the water depth, which means nearly 20 times the hydrostatic water pressure to drive a potential failure**. There were more than 15,000 people at risk in the downstream flood area (the Rexburg, Idaho area) compared to more than 3,000 people downstream from the Buckeye Lake dam.

The total number of fatalities from the Teton Dam failure was eleven. Two of the fatalities were fishermen in the Teton River Canyon, a short distance downstream from the dam**. A proportional comparative risk analysis of the Teton Dam failure that involved (1) substantially greater risk factors and (2) a very low number of fatalities indicates that the probable loss of life for a Buckeye Lake dam failure would be ZERO.**

20. Summary and Conclusion

The USACE report is a totally inaccurate analysis of the dam situation at Buckeye Lake. The report is full of errors, misjudgments, and serious omissions. The report alleges that the homeowners, adjacent to the embankment, are the cause of the most serious dam safety risks. **In fact, the most serious risks at Buckeye Lake are (1) Deterioration of the masonry and sheet pile walls, and (2) years of mismanagement and neglect by the ODNR dam safety bureaucracy. The ODNR mismanagement includes (1) the lack of proper or timely maintenance and repairs along the dam, and (2) even leaving large "holes" in the top of the dam filled with ground-up sawdust, woodchips, and topsoil from stump grinding the stump and roots of large trees. The USACE dam (stupid) engineers never addressed the stump grinding issue in their report.**

USACE Allegation (USACE report, Executive Summary, page IV): "...the District has determined that embankment breaching, down cutting , and lake discharge and resulting flooding would probably occur without sufficient warning or evacuation time." In other words: **A non-existent or insignificant hydrostatic pressure is "likely" to suddenly power through the comparative minor defects in the Buckeye Lake dam and very quickly cause a complete failure of the dam.** Where is their real world example or scientific analysis of such an unfounded and irresponsible statement? To summarize: The USACE dam engineers have made an allegation without offering any real world evidence or scientific analysis to document this claim . **This USACE "determination" remains an allegation only and not a ''fact'' on which to base Smart Public Policy engineering decisions**.

What is the design concept for a "new" Buckeye Lake dam, other than the frequently stated cost of $150 million, or nearly $700,000 for every 100 feet of lakefront frontage? We, the taxpayers of Ohio, have a right to know up front what kind of a dam construction program is being "cooked up" in order to spend $150 million of our money. **It is very likely that their dam project includes "building a new dam" 20 feet in front of the existing wall and then filling that 20 feet with two new sheet pile walls, concrete, and backfill**. (See Section 17 above for details). **Such a plan would make the lakefront, in effect, a highway construction site extending along the entire 4.1 mile long embankment.**

The seriously flawed USACE Report using "lives at risk" is obviously a scare tactic and "smoke screen" to justify the dam engineers and bureaucrats agenda to drain the lake permanently until an expensive "new dam" project is completed. How many rubber stamps have been used by those involved in coming up with this plan?

The construction project that an **out-of-control government bureaucracy** is very likely "cooking up" can be summarized as follows: **"A jobs bill for some big dam contractors, at the expense of Ohio taxpayers, thousands of Buckeye Lake area residents, hundreds of small businesses in the region, and the precious natural resources in the area. The government bureaucracy has yelled FIRE IN A CROWDED THEATER BECAUSE SOMEONE LIT A CIGARETTE.**

RAYMOND E. KARLSBERGER
BUSINESSMAN
SMART PUBLIC POLICY ADVOCATE
OHIO TAXPAYER

List of Exhibits in Letter Dated June 10, 2015 from Raymond E. Karlsberger

Exhibit 1 **Buckeye Lake Dam Statistics as of April 12, 2015**

Exhibit 2 **Buckeye Lake Dam Statistics as of May 3, 2015**

Exhibit 3 **ODNR Dam Risk Reduction Program**

Exhibit 4 **ODNR Division of Parks & Recreation Policies and Practices**

Exhibit 5 **ODNR Division of Parks & Recreation Application for a Dock Construction Permit (2 pages)**

Exhibit 6 **ODNR Division of Parks & Recreation Seawall Construction Permit**

Exhibit 7 **ODNR Information Sheet for Realtors and Brokers Surrounding Buckeye Lake**

Exhibit 8 **"Evacuation Route" Highway Sign and I-70 Detour Signs at SR 79 and SR 37**

Exhibit 9 **"The Day the Dam Broke" by James Thurber**

Exhibit 10 **House Buckeye Lake Caucus, Riffe Center, April 30, 2015 (3 pages)**