The Vision
Promises Made and Lies to Tulsans

* 2016 Promotional TV videos just prior to voting

Note to readers: Many underlined text and graphical pictures link to enlarged or actual videos, etc. Move mouse pointer over items to access them.

Promises Made

* Purpose of this document
  * Explore the perceptions and expectations of Tulsa citizens for the new dam, other structures, and features to be built
  * See if all promises and public expectations will be fulfilled
  * Provide information not presented or misrepresented to the public

Various Expectations Presented to Voters

* Public meetings, newspaper articles, and other media touted numerous fantastic benefits
* Concept: Series of three low water dams at Sand Springs, New Zink Dam, South Tulsa/ Jenks
* Creation of lakes with the following claimed benefits
  * Boating, sailing, swimming/tubing, rafting, white water kayaking, triathlons, boat parades
  * **High level competition lake** for unspecified events but assumed competitive rowing events
  * Recreational and competitive kayak flume that would draw several high-level events per year
  * **Huge economic value** to the area from various events and uses to the tune of $122 million annually and over 1,800 new jobs annually. More jobs each year than any other business could ever provide to the city.
  * Pedestrian bridges at all lakes
  * Improve the ecosystem for fish and other wildlife including fish passage
  * Improved safety by eliminating problems with existing dam caused by "roller effect" also known as the "keeper effect"

Initial Problems and Misrepresentations

- Full funding currently unavailable for Sand Springs or South Tulsa/ Jenks dams
  - Corps of Engineers has plans to possibly rebuild old Sand Springs dam that was removed due to deaths caused by "roller effect" of water
  - Requires local partner funding of unspecified amounts to build which as of 2023 has not happened. It is taking since 2019 to proceed but funding not available yet.
- New Zink Dam is presently the only dam fully funded, designed, and awarded for construction
  - Bids came in 25% higher for dam, recreational water flume, and pedestrian bridge from "certified" estimates. Additional funding sources were required for grossly over budget bridge.
  - Vision 2025 budget is $63 million for new Zink Dam including new bridge
- No valid economic analysis was ever produced to show economic benefits of lake
  - Initial econ study completed in Jan 2016 by OU relied on key activities which cannot take place in New Lake
    - Study based on unsupportable assumptions of the possible uses for the lake and flume provided by the Tulsa business groups
      - Assumed high level rowing competitions, triathlon swimming in lake, boat parades, etc.
    - Therefore, study is flawed and should be ignored
    - Public was not made aware of this report prior to Vision 2025 voting so that it could be scrutinized. Report is available.
    - The TV sales pitch ad, presented on first slide, touted an economic impact of $122 million annually and 1,850 new jobs . Ad was based on this grossly flawed study therefore there will most likely be no increased economic gains beyond that which the old dam provided.
- Vision 2025 voting April 2016 approved with less than 19% turnout and was purposely put in with the economic package rather than letting voters vote on just the dams (political log rolling)

New Zink Dam

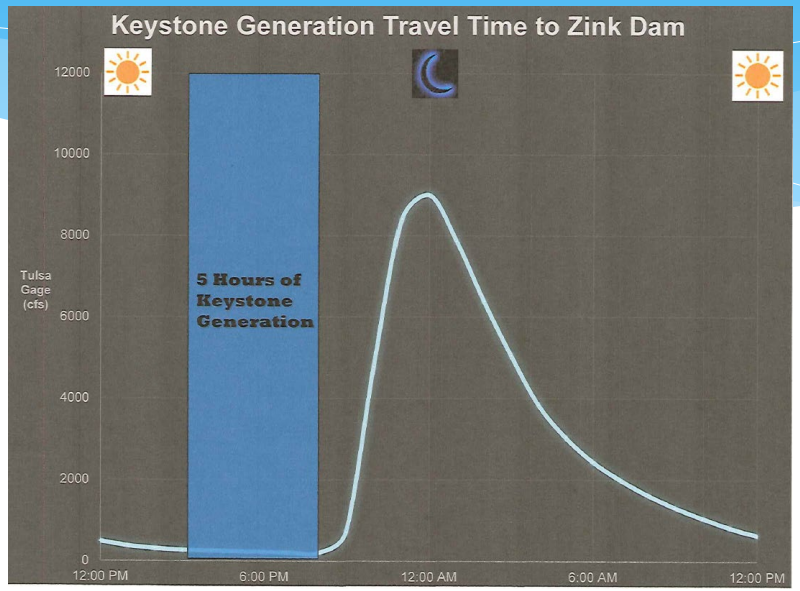
Facts and claims

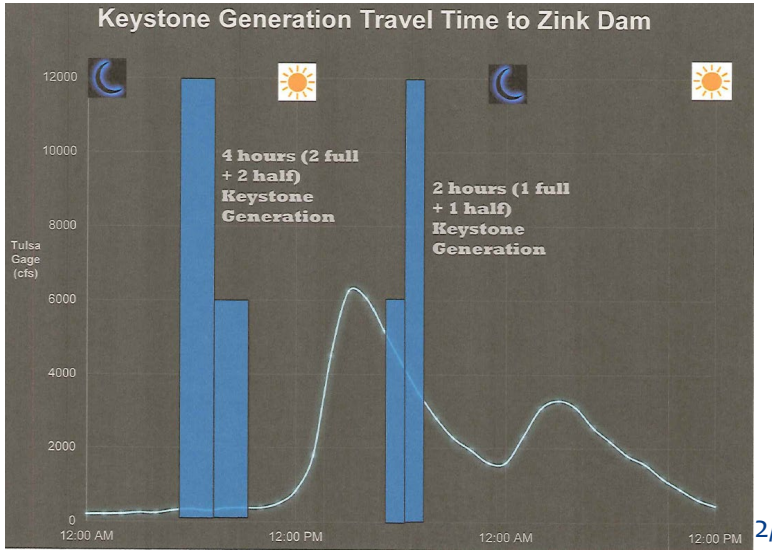
* New Zink dam will only raise the water level by 3 feet above the old dam water levels
* Will have more operable gates in dam that can be lowered flat in the river when needed will possibly allow slightly less obstruction to flow in the river
* Design is capable to allow fish passage assuming main gates are all the way down and there is no lake
* **New design does not reduce the flooding dangers to homes and Gathering Place upstream of new dam as it could have by adding more large gates to the dam**
* Gates are made by Obermeyer Hydro with steel upstream panels and inflatable bags to raise and lower them
* Recreational water flume on east bank adjoining Gathering Place
* New pedestrian bridge built upstream to replace existing bridge

City Justification for a Dam

City Mantra: Put more water in the river!!

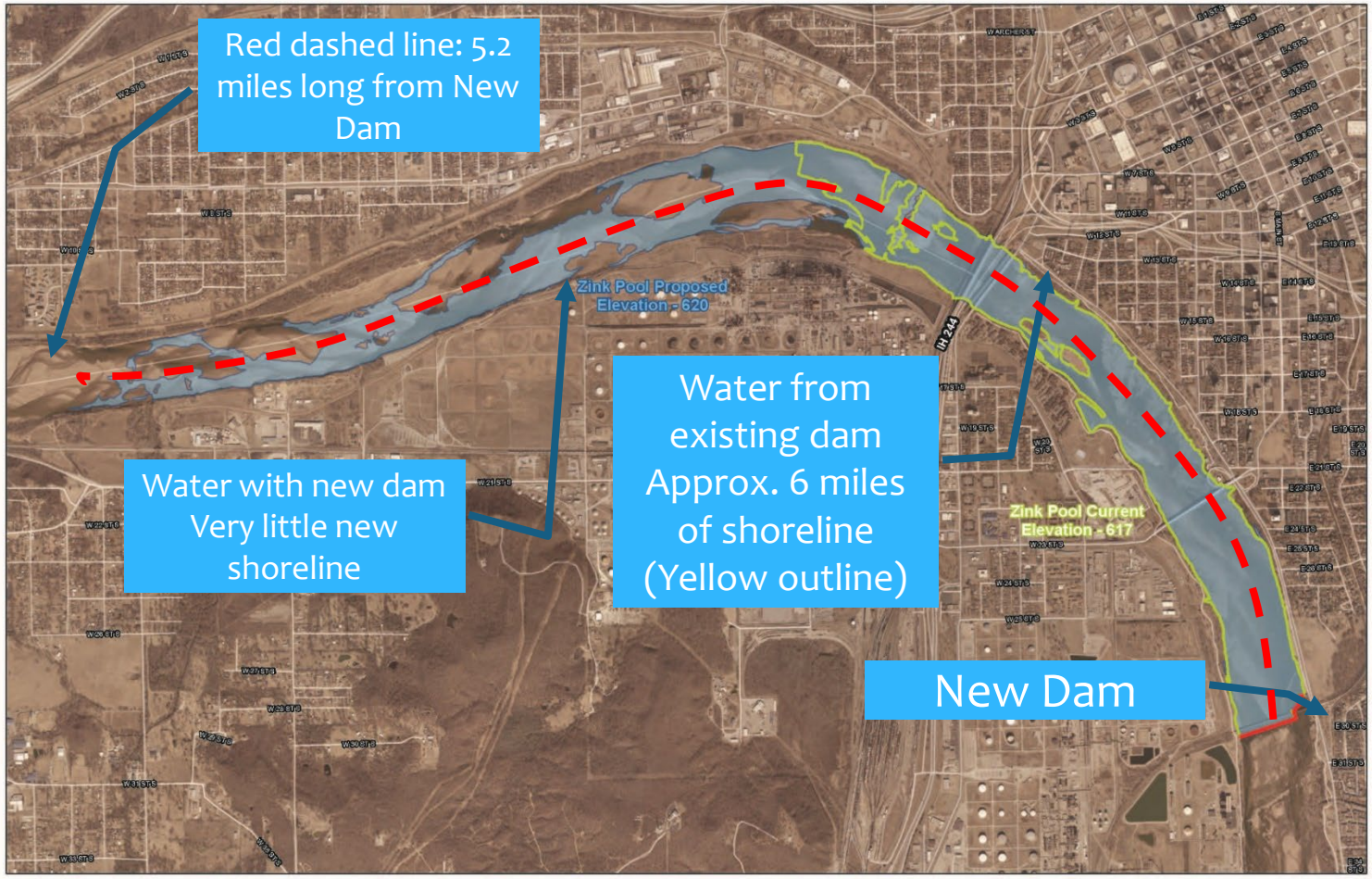
* Without the new dams much water only flows due to hydropower generators at Keystone
* Without a dam most of the flow from Keystone generation will not be visible many times when it arrives at Gathering Place area in early morning (See graphs)
* Generators are primarily used for peaking power to match power loads
  * Summer daily generation and flow profile (top)
  * Winter daily generation profile (bottom)
  * This information briefed by SWPA to City committee during planning meetings
* This sporadic flow was the primary justification for the new dams and help even out the flows somewhat downstream of new dams
* However, when the old dam was operating properly, it supposedly fulfilled the same flow regulating purpose





How Much Water?

* The new dam will only raise the water level by 3 feet.
* There will not be "12 miles of new shoreline" as advertised from just the New Lake. It would take construction of multiple dams to result in that length of new shoreline.



The shoreline gained by new lake is outlined in yellow. Above that the river is just a bunch of shallows as you can see here. Not bank to bank.

How Fast Will the Lake Fill or Empty?

- As long as a single Keystone generator is running or dam releases are 6,000 cfs or higher, lake pool can fill in a few hours for this amount of continuous flow during that time
- If there is no inflow greater than 1,000 cfs from Keystone to replenish New Lake, with a full New Lake pool and assuming water is allowed to flow through the dam for wildlife:
  - New Lake would drain the upper 2 ft. in 10 hrs while providing a continuous 1,000 cfs downstream flow.
  - Recreation flume needs (50-500 cfs) from upper 4 ft. of the lake pool. The useful upper 4 ft. of water from pool would be consumed in roughly 17 hrs to 7 days if lake drained through flume operation
  - Additional flow required through dam gates for fish (300-1,000 cfs). At 1,000 cfs the pool is estimated to drop below 8 ft. in depth in 14 hours and pool totally emptied in 1 day.
  - Corps of Engineer documents confirm generation or releases greater than 2,000 cfs are required daily to maintain constant minimum flow in river.
- Historical river flow data in New Lake shows there is about a 1 in 5 chance that flows will not replenish water in pool on any given day from August to April. (See diagram to the right)
- The Sand Springs dam may not ever get funded.

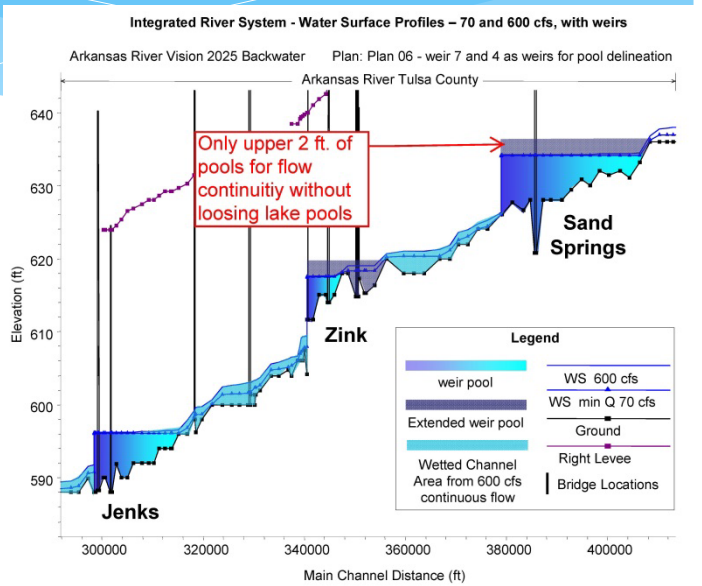
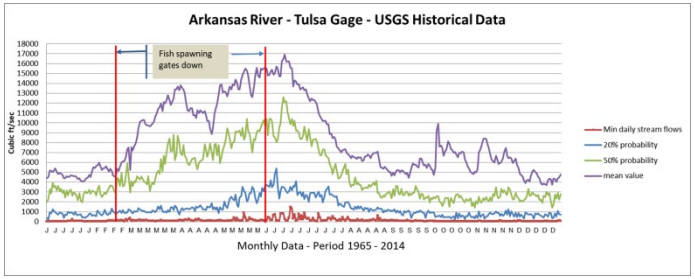


Figure 2. Water Surface Profile View Showing Weirs and integrated River System Concept



2/26/2024

Fish Concerns

* Bottom line: Since Keystone generation does not occur over many consecutive days, especially in low flow summer and winter months, a single day of generation water will be depleted in a day unless water is completely trapped in the pool or water releases are made through Keystone dam.
* If pool water is trapped in new lake and not released, fish kills can result downstream of dam or within the flume like in 2018.
* According to OK ODWC fishing in the Tulsa County region accounts for an estimated 2500 jobs and $16+ million in sales tax revenue to the City and County, far above what will be gained by new lake.
* Increase in fishing revenue virtually guaranteed if water quality increases in river and dam allows regular fish passage
* **Note: Corps of Engineers has no requirement at Keystone Lake to release water for wildlife or river water quality improvement**

(click on photo)

How Will It Look And Perform?

Since:

* The new dam will only raise the water level 3 more feet than old dam
  * Existing depth at new dam can be 8-10 feet if sediment is removed as originally planned
  * Depth 500 ft upstream of new dam 10 feet if sediment is continually removed
* The existing dam gates do not adequately allow for fish migration except through large gates that will drain the lake when fully opened.
* There is a 2-3 foot rise between flume pools that fish would need to jump over to get up through recreation flume thus eliminating the flume for fish passage.
  * (Note: In a 2021 meeting the designers finally admitted that fish cannot migrate up the flume. This fact makes the information provided to the Corps to get the 404 permit false and should result in terminating the 404 permit by the Corps but the Corps has no plans to intervene.)
* Just like the existing dam, the new dam must allow some low flows of 500-1,000 cfs to pass through dam to avoid fish kills
* Average and typical seasonal daily flows from Keystone Lake will most likely remain about the same
* Result:
* "In a dry period and if operated as promised for fish passage, the river will look like it does now – a "braided river" state with water
* levels fluctuating in response to water releases from Keystone Dam." and "River will look about the same as now especially between lakes."
  * Source of statement: Historical river flow data and past Vision 2025 website Q&A page.

Fish Passage Lies

Various documents and public presentations showed that the new dam would allow for fish passage.

* The documents for the Corps 404 permit stated:
  * "This recreational flume would also serve as a roughened channel that under certain river flow conditions would facilitate fish and egg passage.."
  * This statement did not guarantee fish passage as anglers and wildlife agencies expected.
  * Fish passage up through the flume was later proven to be a lie.
* The dam operations plan submitted by the City and approved by the Corps stated the gates would only go down to allow fish and egg passage when river flows exceeded 40,000 cfs.
  * Historical river records show that 40,000 cfs flows occur less than 5% of the time and during the end of the spawning season rendering fish spawning totally blocked.
  * Another sales pitch lie by the city engineers carefully constructed to fool wildlife enthusiasts to vote for the project!

Why will it look about the same?

* Answer:
  * Even if Sand Springs dam is built the planned 1000 cfs of flow downstream of new dam will be barely noticeable (100' wide x 2.25' deep)
  * New Lake pool must be empty weeks on end February through May to allow fish migration and spawning because large gates must be fully down
  * New Lake pool could be empty December through January and July through August due to typical low flows into river from lack of Keystone dam releases
    * If no inflow to Keystone lake – No outflow from Keystone into the river
    * No power generation at times due to lack of water, generator maintenance, power grid constraints, or major work on turbines or generators
    * Unfortunately, generation does not always occur 5 days per week as claimed
    * Historic low flows in river can be 300 cfs or lower
    * Impounding water in lake during summer will just make bacteria and other pollutants higher unless flushed regularly

What does this mean as to what we can expect the river to look like?

We can compare it with how it looks now during varying conditions or months when old dam was in place

Note: While viewing the next slides, keep in mind that the old dam was in operation during these photos and impounding water when available. If fish passage during certain periods is allowed as promised, Feb-May will look the same as in photos

How Will It Look?

January 2019

Good to moderate flow possibly due to generation and Keystone releases

River would look the same with no dam

How Will It Look?

February 2013

Low flows with no generation taking place.

New dam would look the same this month with main gates down for weeks for fish spawning and migration

How Will It Look?

March 2015

Low flows during wetter season with no generation taking place.

New dam would look the same with main gates down for weeks for fish migration

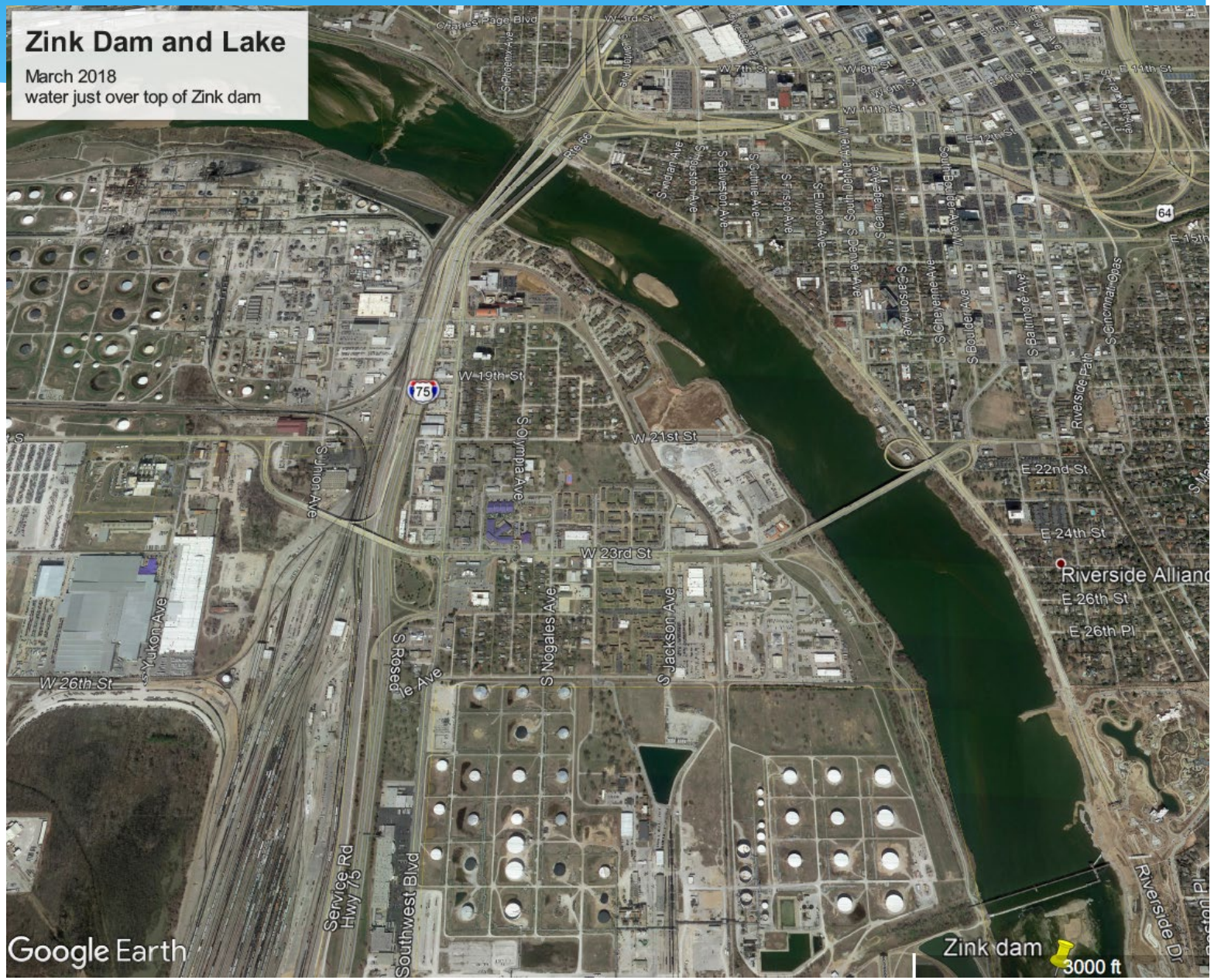
How Will It Look?

March 2018

Moderate flows

If dam gates are up, this is about what it would look like after power generation releases

New dam would probably not look the same in March with main gates down for fish migration



How Will It Look?

March 20, 2015

Low flows with no generation taking place.

New dam would look the same with main gates down for fish migration

How Will It Look?

March 29, 2015

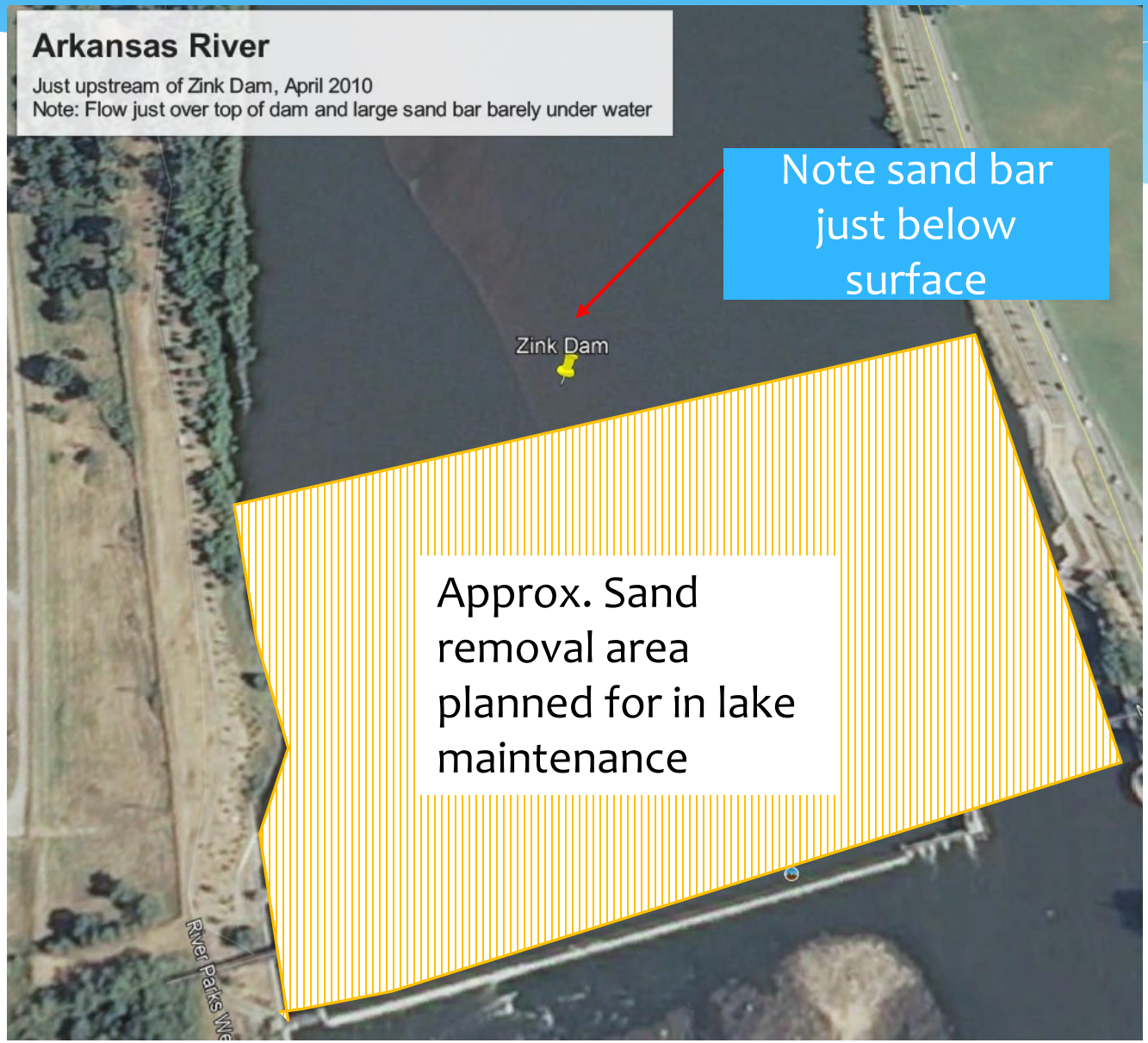
Enlarged view at the existing dam from previous slide showing amount of water flowing through existing gates

How Will It Look?

April 2010

What happens when fishing boats or sail boats run aground on the numerous sand bars upstream of new dam?

5-yr sand removal only budgeted for first 500 ft. (hashed area) upstream of dam
Rock removal not in city plans

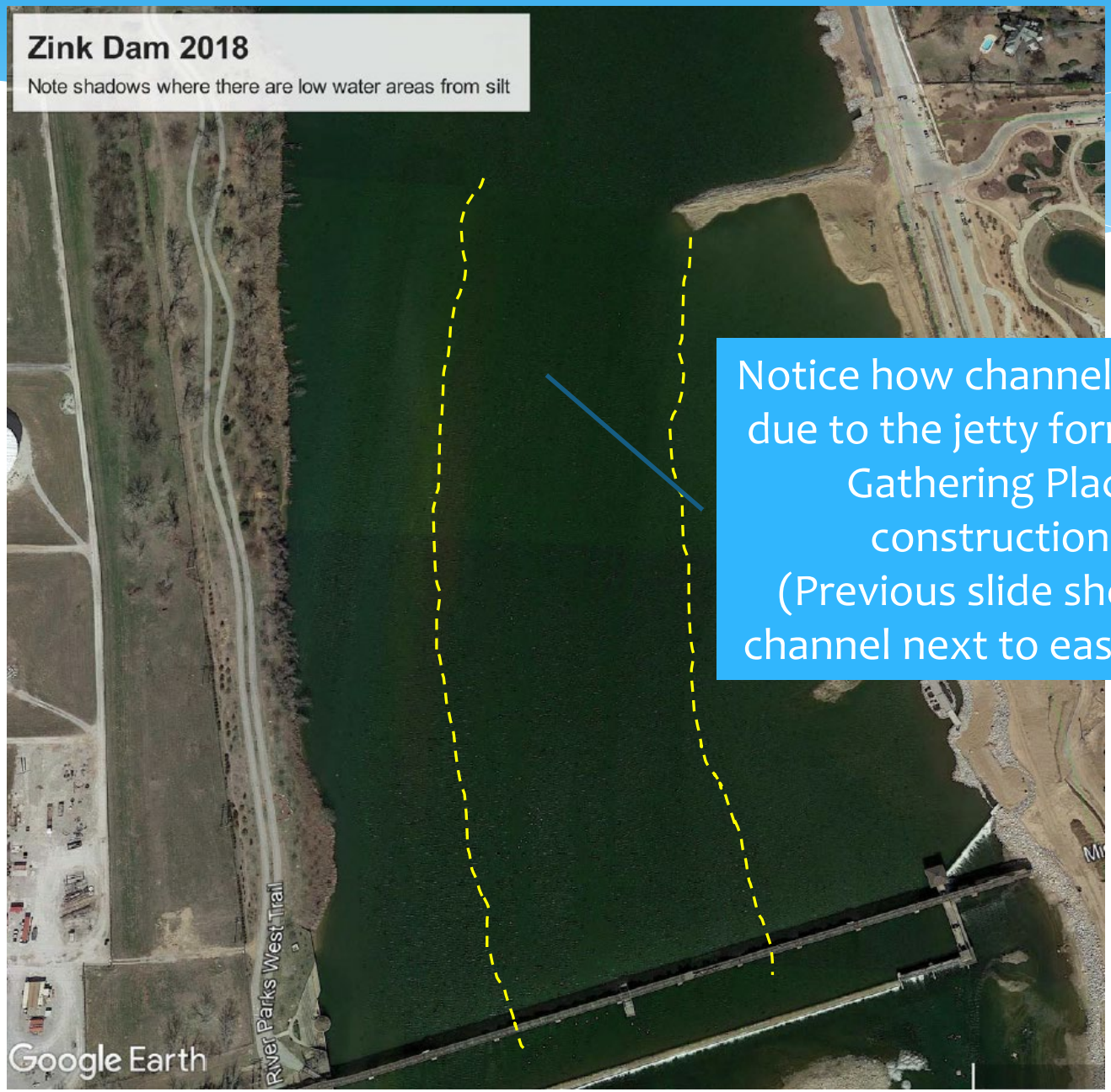


How Will It Look?

2018

Sand bars and channel will constantly shift depending upon flow direction in the river.

Any proposed boating activities must be aware of shallows and sand bar locations to avoid running aground and being stranded.



Notice how channel shifted due to the jetty formed by Gathering Place construction. (Previous slide showed channel next to east bank)

How Will It Look?

May 2017

It does not flood every May like in 2019!

Construction contractor is allowed to use river sediment up to 23rd St. bridge for temporary coffer dams. Other than that, no sand will be removed after completion except 500 ft upstream of dam every 5-yrs.

How Will It Look?

June 2011

Beginning of drier summer months.

This is the end of fish migration season

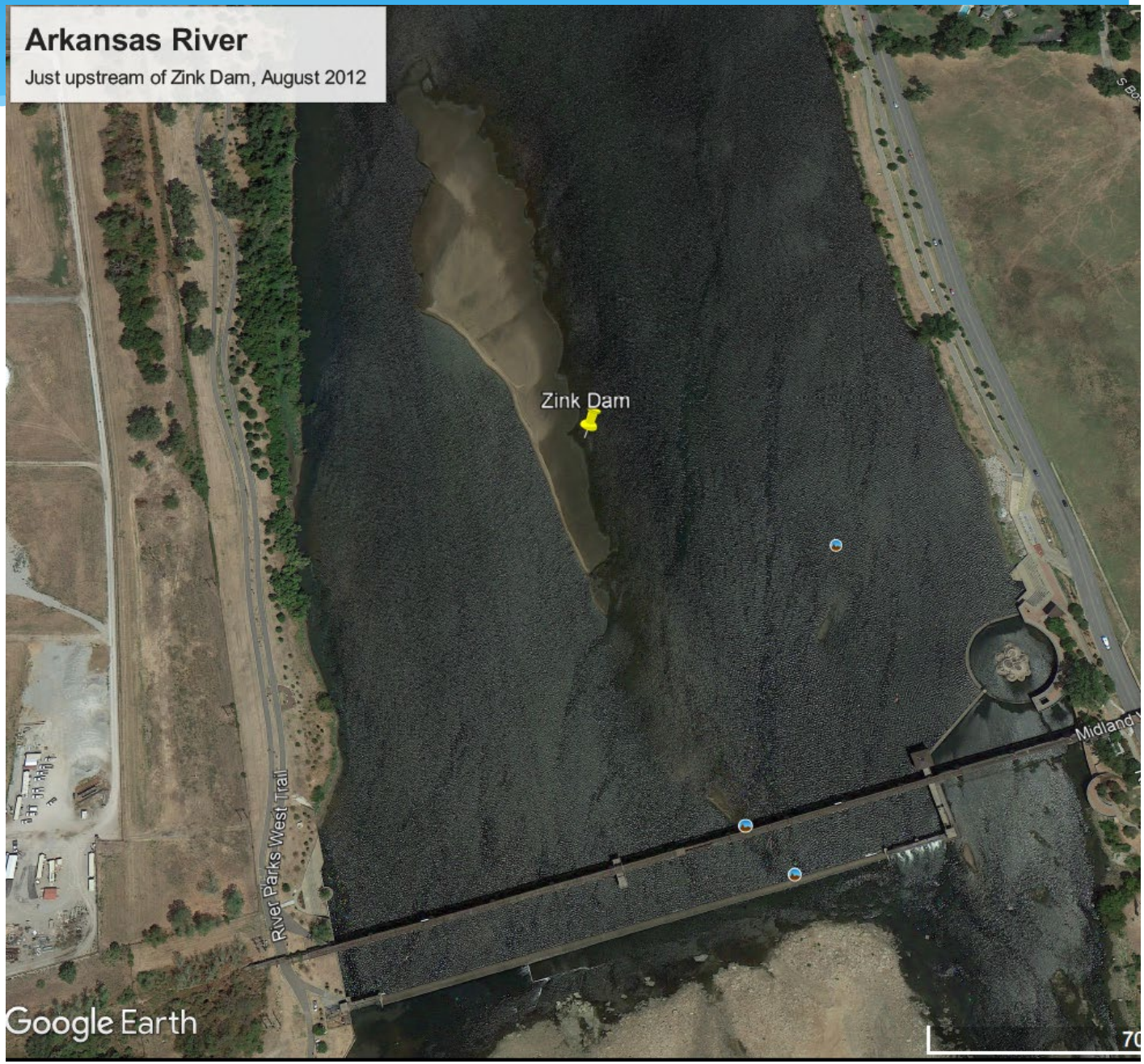
Most likely some releases took place from Keystone providing water in this photo

How Will It Look?

August 2012

Low flow summer months

Most likely some releases from Keystone or at the end of a day after pool is depleted from minimal releases



How Will It Look?

November 2013

Fall and winter are not higher flow months but rather low flow months

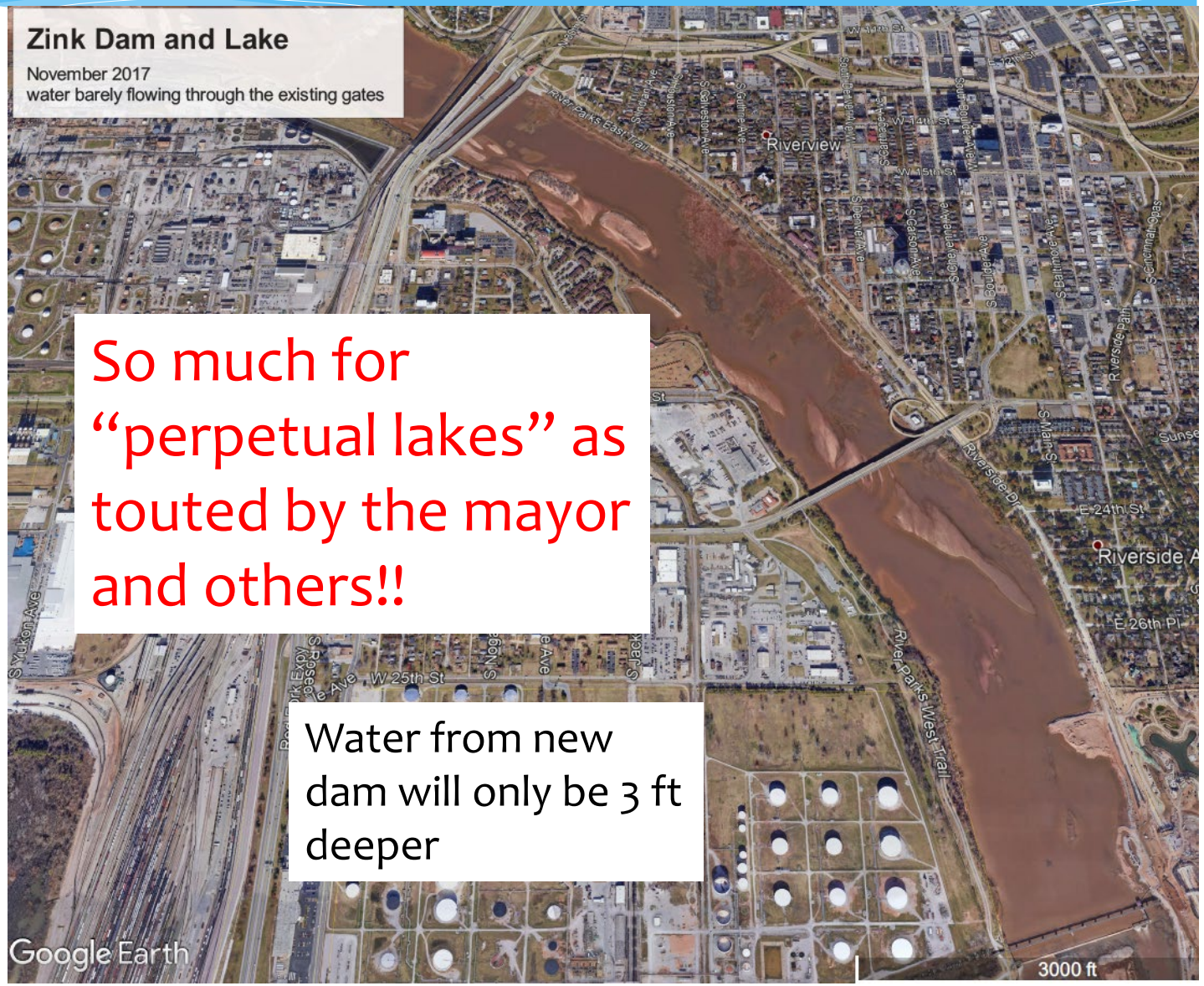
How Will It Look?

November 2017

November through January can be low flow months

You have now seen what the river will most likely look like in any given year.

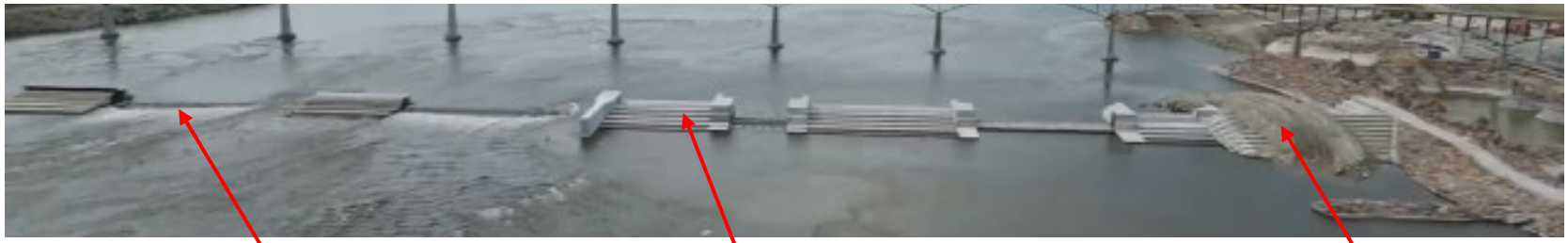
It will be even worse without the Sand Springs dam!!



How Is The Dam Designed and Promised To Operate?

Full height gates: Always up except during fish migration, when lake is emptied for water quality, and high flows in river, then fully down. During low flow conditions they will need to be lower or completely down at times to keep flows moving and to avoid fish kills downstream. This means regular or daily lowering of gates and loss of pool if Keystone releases are not made daily.

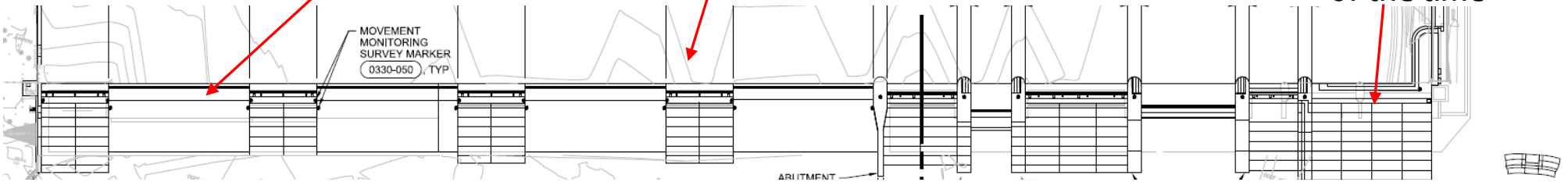
Crest gates: Gates regulate flow at upper 3 ft. of pool level and provides visual effects during adequate flow conditions. Gates down during high river flows and fish cannot get over them



4 – 11 ft. full-height gates with flat discharge sill

7 Crest gates with stair step discharge

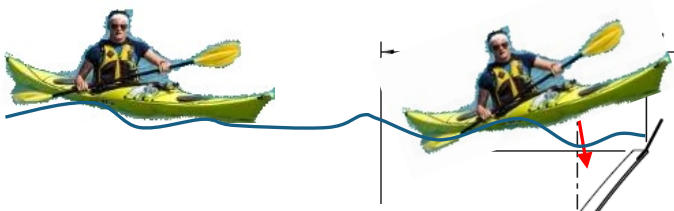
This structure has no gate and will be dry most of the time



New Dam Plan View

New Dam Safer?
Full Height Gate

Sets maximum pool level 3 ft. higher than existing at elevation 620.0



No barriers to prevent this.
11' drop over top of gate to concrete sill.
Will kayakers attempt this? (Click here)
Safer??

Existing dam weir to be removed (faint line)

Only these gates can pass fish and a bit of sediment but only when completely down. (video)

Consultants warn that unless new gate is fully down, the same "roller effect" will be present when flows are greater than 12,000 cfs in river. The city plans to operate dam such that this situation will occur.

2/26/2024

New Dam Crest Gates Safer?

Crest gates regulates pool level over a maximum range of 3 ft. Gate should be fully down to minimize overturning kayaks or boats inadvertently going over gate. Adequate water must be provided for safety of boaters that would overturn and impact steps.
A little more than half of the dam consists of crest gates like these.

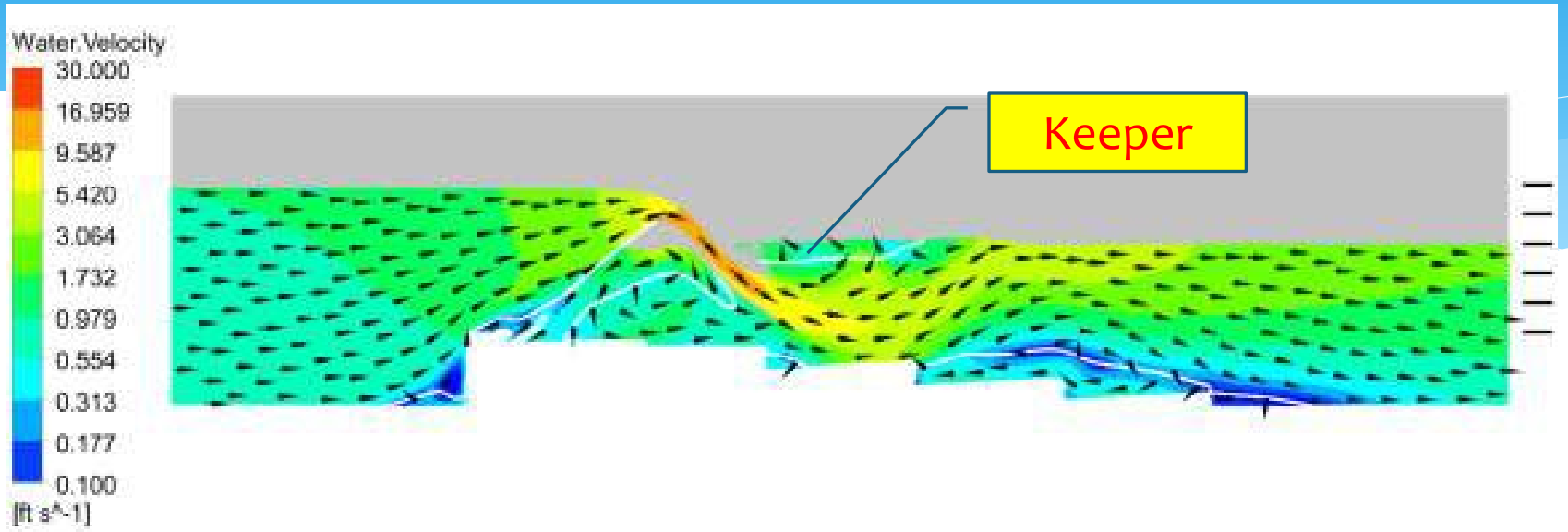
11’ high full height gate

Crest gates cannot control sediment buildup except when sediment reaches top lake surface.

Passage of fish essentially impossible past these gates except during flooding conditions
(Fish and Wildlife Service)

Total flow capacity all crest gates approx. 5,400 cfs to match generation flows for generator unit. Above 12,000 cfs large full height gates would need to start lowering

“Roller Effect” Eliminated?

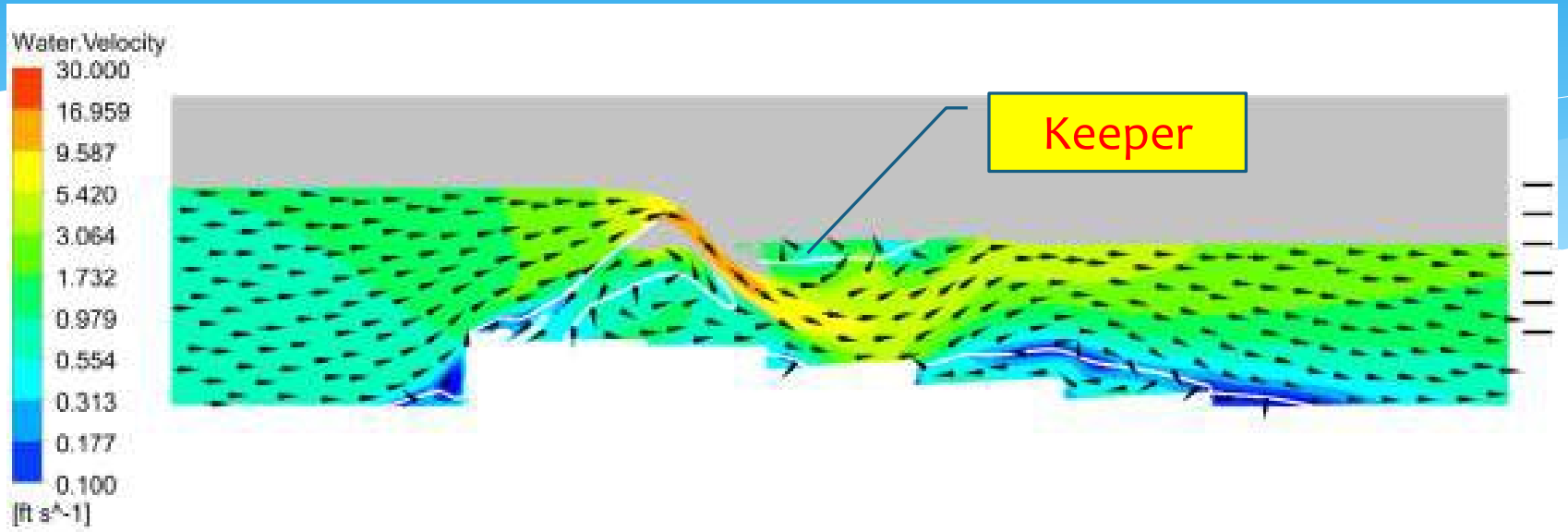


* The city and consulting engineers have in the past briefed citizens in numerous newspaper articles and TV interviews that the **new dam design has eliminated the “keeper effect “ (a.k.a. roller effect)**

This is not true!!

* As in one of the previous slides it is noted that unless the Obermeyer gates are either fully up or fully down the keeper effect will still occur in many common flow conditions over the gates.
* The pictorial computer flow simulation above, presented at a 2020 meeting by the consulting engineers, shows the “keeper” development over even the stepped crest gates when downstream water levels exist.
* **The hydraulic engineers who designed the flume warned the city via the consulting engineers of this condition.**
* What this means is that there will be many flow conditions where the gates must be completely down and the lake mostly drained.

“Roller Effect” Eliminated?



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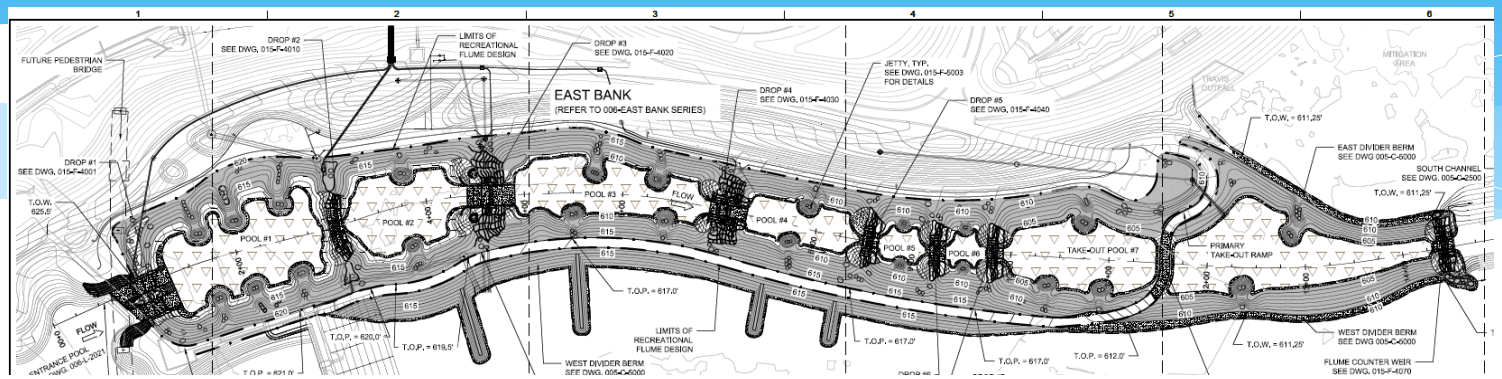
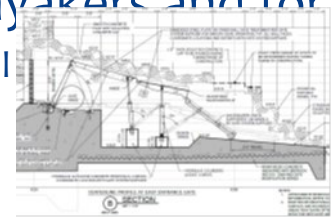
RECREATIONAL "WHITE" WATER FLUME

North



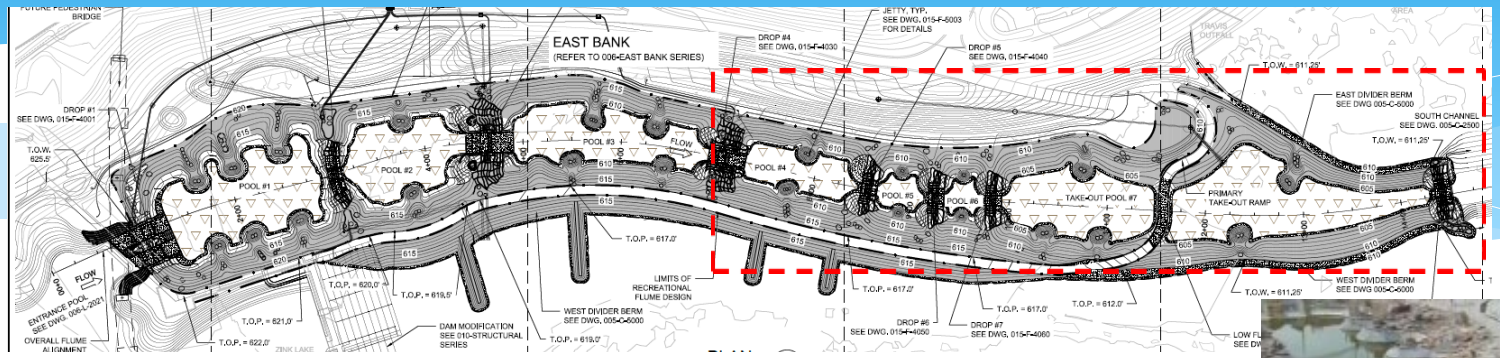
- River water flow through flume manually controlled by a wave shaping gate and control gate at north end of flume.
- Present plans are that users must get approval from River Parks to use flume although there will probably have to be some flow through it at all times to keep trapped fish alive in the pools.
- Water turbulence (white water effects) controlled manually by a hydraulically operate gate at flume entrance point and "wave shapper" gates at the next two weirs along with concrete blocks in bottom that can be repositioned
- Need 50-500 cfs of flow through flume for functionality
- Flow velocities will normally be too high for inexperienced kayakers and for general public use. (To see details of the waveshappers click on cross-sectional view to the right)



2/26/2024

FLUME ISSUES

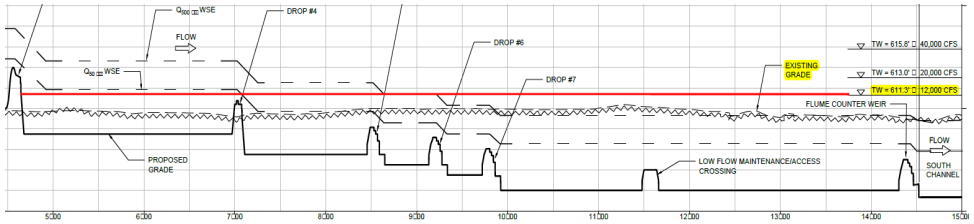
North



Fact: A large portion of the flume (dashed red area) is below the natural river bed.

* Any river water downstream of the dam will back up into the flume pools
  * Lower pools are below natural riverbed
* Full length of flume may only be usable with
  * Very low (< 1,000 cfs) or no river flow downstream from new dam east gates and all flow through the flume
  * Very low or no inflow to full lake that could back water up into pools
  * May require spilling water over far west gates to keep backwater to a minimum. (not desirable from safety aspects)
  * Flows of 1000 cfs or less occur on average less than 19% of the time May-September.
* When one or more Keystone generators operate, or comparable flows come from Keystone dam spillway gates, the lower portions of flume (red area) could just be normal river water with no drops creating "white water" conditions
  * Generation flows can create this condition over 50% of the time on average, morning to midday.

(To see details of the water levels click on cross-sectional view to the right)



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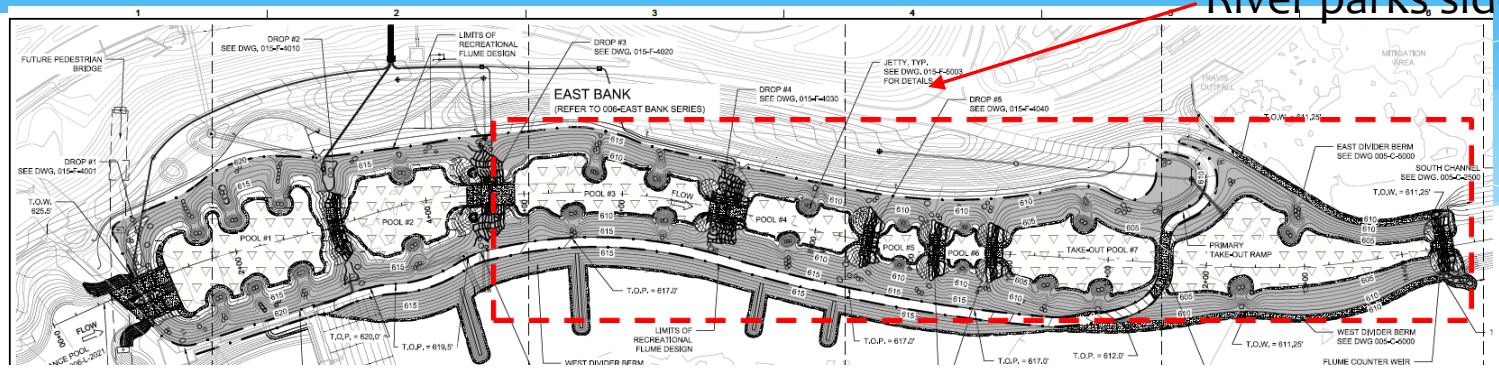
RECREATIONAL "WHITE" WATER FLUME ISSUES

North



- Safety concerns:
  - Operation and access control to keep people out of flume indefinite at this time
  - Riverparks sidewalk trail at Gathering place on east bank, high pedestrian traffic
    - No fencing to keep small children and others from flume
  - No policies presently set to limit access for purposes other than kayaks. For safety flume should only flow water during controlled events or for flushing flume
  - Occasional ingestion of some polluted water can be expected from kayaking and tubing
  - Skin scrapes and cuts are inevitable while in the flume. Infections will result from polluted waters
  - Presently ineffective cable/buoy barriers upstream are the only barriers to prevent boater access to main and crest gates. Buoy barriers do not block the flume. Flume boating accessible any time water is flowing through flume.
  - Flume pools accessible 24/7 by anyone.
  - City government officials touted possible use of flume by people on innertubes and other flotation items
  - Liability issues: Accidents will happen. Who will be liable?

- Maintenance: Normal water levels in river downstream of new dam during power generation will inundate flume and trap debris and fish in the various pools (dashed outline)

"WHITE" WATER FLUME CONCERNS

Other concerns:

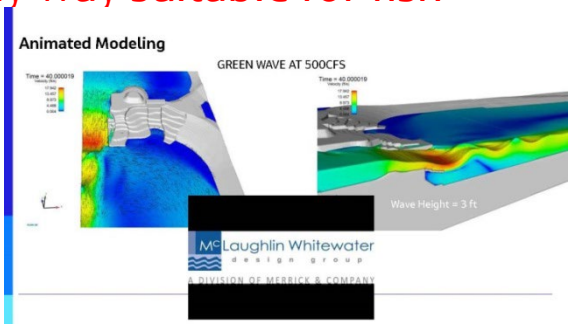
* Turned over to River Parks Authority after completion.
  * Same entity has failed to maintain or operate existing dam as promised since 1978.
* Who will operate the boating activities, recreational flume controls, and be liable for injuries? River Parks Authority?
  * City can be sued due to injuries, sickness, death especially since they have advertised uses that encourage "tubing" or unregulated public access.
* Greater security, policing, and emergency response will most likely happen and will be assumed by City
* Unfenced access to flume and entire downstream side of dam by anglers and other pedestrians will be a greater safety concern than old dam

FISH PASSAGE THROUGH FLUME?

Impossible!

- The 404 permit authors believed the flume will allow for fish migration upstream. However, the species of fish in the Arkansas river are not salmon and cannot jump over obstacles. They must swim past or within 1-2 feet deep flows of water.
- The hydraulic engineers who designed the flume stated the flume never designed for fish passage
- The "waveshapper" gates in the flume require fish to jump 1-5 ft depending on the position they are left in after use.
- For successful upstream migration of all species of fish they must swim past very low rises in the river and at fairly low river water velocities of 1-2 ft/sec.
- Boat and water velocities through flume can be extremely high (17 ft/sec, 12 mph) with entrance gates down according to calculations and the modeling shown below
- Only time fish could pass through flume is if the flume gate is completely lowered and there is enough river flow to build the water downstream of dam to the same level. This would allow a few fish trapped in the first pool to pass over gate during a very narrow time when the flow is slow enough and 1-2 ft. deep.
- These facts mean that the flume cannot be considered in any way suitable for fish passage upstream.

Fish passage is a specific requirement of the 404 Permit from Corps of Engineers.



New Dam Required Operations

* Gate operation
  * 404 permit for old and new dams required fish passage
  * Present written operations agreement between River Parks and Corps does not adhere to the requirement to lower the gates during migration and spawning as required by Federal Fish and Wildlife Service and Oklahoma Department of Wildlife Conservation
    * City wants to have a perpetual lake and the only time the gates would be down would be when extreme flows greater than 40,000 cfs in the river require the gates to be down
      * Such flows occur on average between 1-5% of any year and fish would be only able to swim upstream at the end of those flows when lake is virtually non-existent and river flows are about 1,000 cfs or less.

> 5. **Plan for Normal Flow Operations**. During flows of 100 to 40,000 cubic feet per second ("**cfs**"), the Project is planned to operate as follows:
>
> a. When Zink Lake has a WSE of less than 616 feet, then:
>
> i. The Plan is for the Flume gates to remain closed until sufficient water accumulates in Zink Lake so that the WSE reaches the minimal normal operations level of 616 feet.

      * The City engineer as of April 2022 stated that leaving the large gates down during spawning is a "non-starter". City staff engineer untruthfully stated in TV interviews that fish passage was not "mandated" by the Corps in the dam permit.
      * **This means effectively little or no fish passage throughout the year!!!**

FISH PASSAGE PAST DAM?

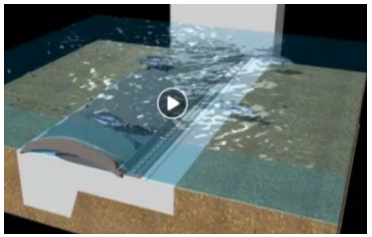
Improbable!

- Numerous technical documents supporting the permit noted that fish passage especially during spawning was "critical"
- Only way fish can get past the dam is with the large full height gates completely down.
- Despite the false information presented by the design engineers to the Public Works Committee, fish and egg passage downstream can only work if at least some of the full height gates are down
  - Full height gate(s) fully down will drain the lake.
- Present approved operations plan written by the city for the dam violates permit and promises to taxpayers and wildlife agencies
  - **City apparently has no intention of supporting fish spawning or passage throughout the year even though:**
    - No one will use the lake or flume after dark
    - Water temperatures will be too cold for recreation except June through September
    - When lake is at lower levels pollution migration from refinery is minimized
- Normal flows from Keystone throughout the year could allow fish passage and use by rowing club with proper operations of the dam
  - Most rowing primarily takes place 5 to 7 PM some days M-F and Saturdays.
  - No rowing on Sundays
- Normal generation flows would allow lake to start draining after 6 PM M-F and refill lake in 4 hrs when flows enter Zink Lake in morning hours

- **Operations plan for South Tulsa Jenks dam allows fish passage when flows exceed 1,000 cfs**
  - Such operation comes closer to being acceptable
  - **Zink Lake vs. South Tulsa, double standard?**

New Dam Operation Change Summary

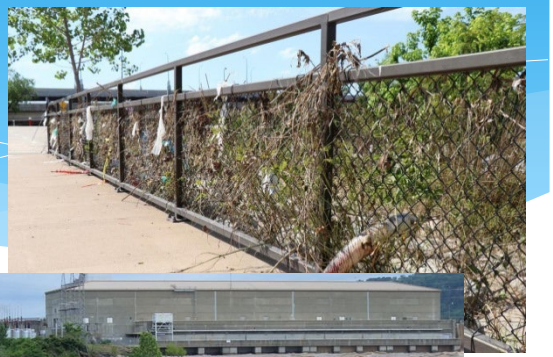
* Large full height gates
  * Can be mostly up much of the usable time except when need for flood releases from Keystone or other operations to keep flows through the dam
  * Large gates should be fully down at least during nighttime hours to allow for fish migration during June-February
  * Must be down completely for weeks and months during fish migration and spawning seasons covering a period from February through May-June depending on species
    * No lake during those times!
    * No other way for fish to get past new dam other than through large full height gates. Fish cannot migrate up the recreation flume
    * The requirement to lower during this season for spawning is extensively documented in project reports and was used in justifying project (video to right shown at planning committee meetings and public presentations to display features)
    * Striped Bass eggs and other fish spawning need gates to be fully down or they will die in the lake
      * One or more full height gate must be <u>completely</u> down for weeks so that high velocities will not inhibit spawning egg passage and migration of all species. Velocities 2-5 ft/sec required for passage and egg transport. (ODWC and FWS)
    * **No justification for a lake 24/7 throughout the year**



MAINTAINABILITY CONCERNS

Other concerns:

* Maintainability
  * Repair, maintenance, or large debris removal for a gate is only possible during low or no flow conditions or by draining the lake
  * No access bridge over new dam for routine debris removal. South Tulsa dam will have a bridge right over the dam but this concept was scrapped for new pedestrian bridge that is several hundred feet upstream of the dam.
  * Flume and other river debris clean up to be contracted out from maintenance trust fund. Only $10,000/yr set up for this maintenance and lake must be drained to do so.
  * Maintenance trust fund did not include sand removal in 90% of 2 mile lake pool.
    * The only sediment that will be flushed during gate operations is the sediment a very short distance upstream of the four large dam gates. All other sediment and sand bars will remain in the lake.



New Dam Crest Gate Summary

* Crest Gates
  * Provides a visual waterfall effect over stepped discharge areas.
  * Used to control pool levels in upper 3 feet during lower flows and daily power generation flows .
  * Provides beneficial aeration for downstream fish
  * Fish passage upstream impossible through these due to steps and higher velocities
  * Still creates a safety hazard to boaters accidentally going over crest gates during normal operations

New Dam Benefits Promised

Note: These graphics and promises were those shown to citizens at public meetings and statements made by City Council, Mayor, and TV ads prior to Vision 2025 vote. Graphics were from Sand Springs and other dams.

<u>Benefits: Claimed or Actual</u>

* Provides a recreation lake for boating, sail boats, floating, kayaking, etc.
* Will bring Olympic and/or high-level class sports to the river lake and possibly the flume
* Will provide nearly year-round water in the river
* Will provide huge economic returns that will more than pay for the construction within 1 year
* Increase in safety to people, fishermen, or boats compared to existing old dam due to elimination of "roller effect"
* Will provide benefits to fish
  * **Not impede spawning and migrations like existing dam**
  * Will help even out flows downstream by providing minimum flows around 1,000 cfs for water quality

Benefit Analysis – Recreation Lake

- Claim: Provides a recreation lake for sail boating, competitive rowing, rafting, tubing, etc.
  - Water quality would preclude any events other than those that would not involve people accidentally ingesting water
    - Water has always failed testing due to bacteria and toxins
      - Canoes, kayaks, and small sail boats overturn regularly
      - Triathlons are out of the question
  - No certifications from INCOG, health dept., or state agencies that would allow for accidental ingestion of water
  - No in-depth testing for newer toxins of concern has been done by State, County, or Federal entities. Only routine chemicals screened.
  - Documented pollutants are routinely present along west bank and in New Lake due to refinery operations
  - **During public meetings voters were told the water was "cleaner than Grand Lake" by a City Counselor. The Mayor, INCOG, and project consultants state that the water was safe for swimming**
- Question: Why has the old New Lake not been utilized in the same way? After all the new lake will just be 3 ft. deeper. It's the same river water!!

1984 River Parks Sign

New Pedestrian Bridge

- Original plan was to refurbish and improve the old railroad bridge to allow cyclists to ride on a top deck and pedestrians on the existing bottom deck
  - Would allow pedestrians to be shaded
  - Would continue to allow fishing from bridge
  - Would preserve a structure that citizens have treasured and had special meaning such as weddings and other memorable events
  - Would be much safer to be in for pedestrians on lower deck if struck by lightning. New bridge highly dangerous to be on if bridge is struck.
- Engineering study showed bridge could be repaired and upgraded for about $20 million
- Since city engineering could supposedly build a new bridge for $27 million, decision was made to replace it
- Unfortunately, new bridge selected to be built for $27 million came in at $35+ million and was left with no shade
- New bridge will be named "Williams Crossing", even though Tulsans funded the overwhelming bulk of the money.
- New bridge has a 14 ft. total rise to walk up to get to middle of bridge.
  - Handicap and stroller friendly?
- Want more info on this go to : https://pedbridge.com/

New Lake Water Quality

- ODEQ **desired** rating: Primary body contact such as **swimming** or accidental ingestion approved will show (PBCR)
- Table 6.3-1: from Arkansas River Master Plan 2005
- River from Sand Springs to Jenks has never been approved for primary body contact (PBCR)
- Primary issue fecal coliforms, e-coli, and enterococci mostly from uncontrolled sources
- OKC river not suitable either and same designation as Tulsa river. That is why OKC built a treated water facility.
- This stretch of river never fully tested for all hazardous chemicals of concern
- Proposed operation of new dam will exacerbate movement of underground chemicals from west bank into the river. This effect not studied in detail.

BUMP = Beneficial Use Monitoring Program 2016 report same.

Table 6.3-1
BUMP OWQS BENEFICIAL USES

WIBD #	FS	PS	NS/T	CBD
OK120420010010_00 Sand Sprngs-Brkn Arrow	AG, FWP, AES, EWS	NONE	PBCR	NONE
OK120420010080_00	FWP, AES, EWS	AG	PBCR	NONE
OK120410010130_00 Keystone - Sand Springs	AG, FWP, AES, PBCR, EWS	NONE	NONE	NONE

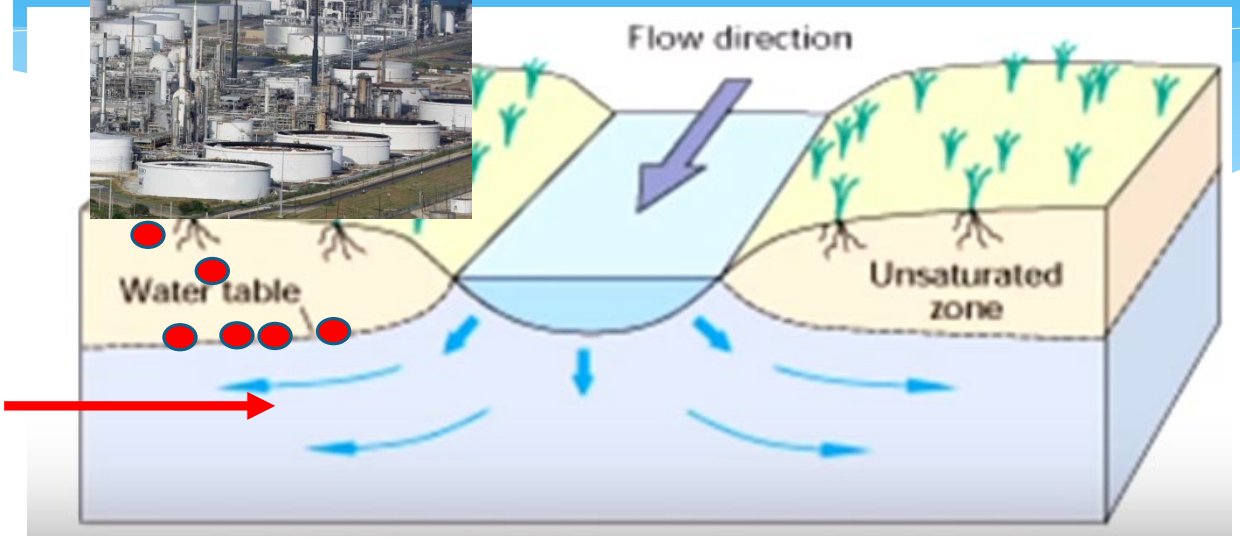
Assigned OWQS Beneficial Uses and Support Codes

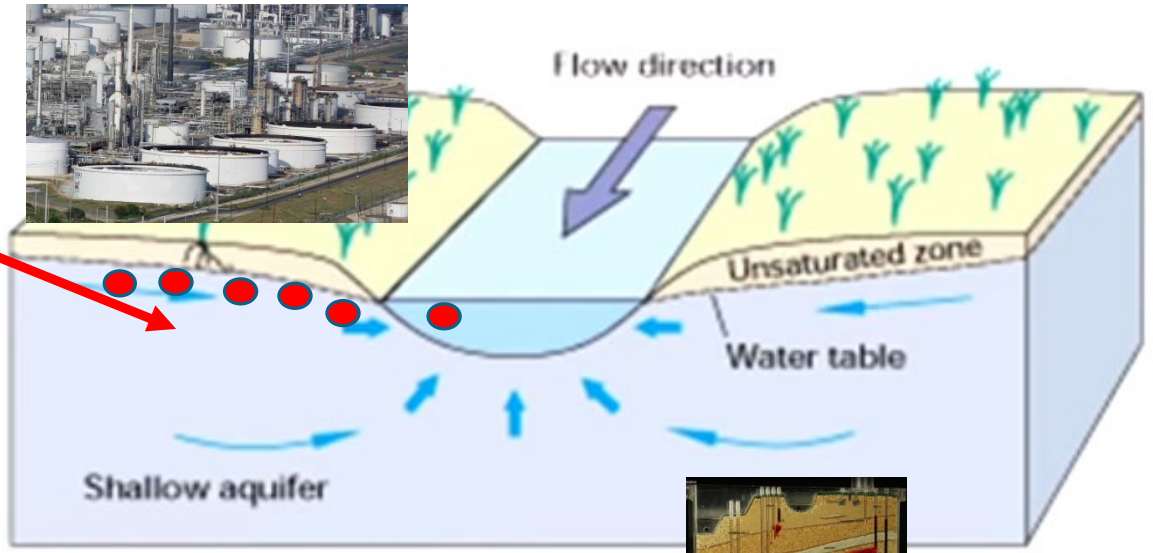
FWP = fish & Wildlife Propagation (Warm Water Aquatic Community)	PBCR = Primary Body Contact Recreation
PPWS = Public and Private Water Supply	AG = Agricultural
AES = Aesthetics	EWS = Emergency Water Supply
FS = Fully Supporting	PS = Partially Supporting
NS/T = Not Supporting/ Threatened	CBD = Cannot Be Determined

Excerpt from USACE water quality report for water in New Lake Pedestrian Bridge: The bacterial criterion was exceeded in 3 of 15 data sets. Two of the exceedances occurred at the east and west bank sampling points in the month of September. The other exceedance occurred in June at the east bank station. This was the only one of all the exceedances that did not occur in August or September. The range of fecal coliform values was 9-12,000. The range of fecal streptococcus values was 9-7,000 The "FC/FS Ratio" reveals that 10.6% of the samples were contaminated by human waste while in 73% of the samples, the contamination can be attributed to animal wastes. In general, the month of September yielded the worst data at this site while the east bank station again proved to be the worst sampling point
The data from this site is never quite as bad as that from the other two bridge sites.

Subsurface Water and Pollution Movement

* Water (blue arrows) with pollutants (red circles) will flow from the river to the refinery or vice versa depending on which water level is higher
* Storage tanks can leak
* When New Lake is full, water will flow out of the river and into subsurface of refinery probably defeating the new caps installed on the west bank to control pollutant flow into river
* When New Lake is empty, water will flow from the refinery and into the river carrying toxins with the water
* Confirmation of problem: Corps of Engrs (CH2M) EIS report for New Lake





<< Video explaining subsurface water flow

New Dam Effect on Water Quality

Since:

* Refinery seeps subsurface pollutants into river annually
* New dam will be 3 ft. higher than the existing dam thus water levels will be higher in the river and more frequent than now
* During normal operations with the gates down the water levels in the lake will be lower than with the existing dam

Result: There will be more subsurface pollution and toxins discharged into the river from the refinery (Source: OKDEQ reports from refinery)

  * Exacerbated health concerns from water contact and fish consumption. Rashes and other maladies can and will result as in the past
  * No meaningful recreation in the river as promised!!

Solutions:

* Refinery must provide long term effective measures to prevent toxin migration into the river and west bank soils. Such measures have not been realized and will not change without EPA action
* If refinery toxins are prevented from migrating into the river, a reduction in toxin migration would eventually occur but that will not happen for decades.
* New dam operations must mimic that of the natural river flow for present refinery pollutant caps to be effective
  * Long term lake pools will create conditions that cause more water to migrate greater distances into the refinery subsurface and force more chemicals downstream past pollution caps now in place on the west bank

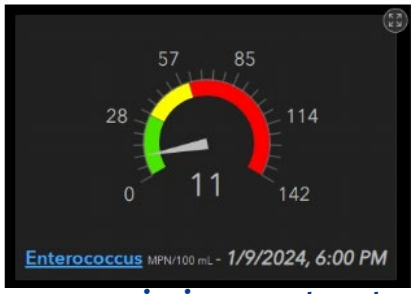
City Water Testing Issues

* A presentation to the Public Works Committee in Jan. 2024 provided the following information
* Testing at for escherichia coli (E. coli), enterococci, and fecal coliform
  * High numbers often indicate other harmful bacteria as well as other disease-causing microorganisms and deadly viruses
  * List of hydrocarbons to be tested unknown at that time
  * Five test sites: Upstream side of Zink dam, in flume, at rowing club ramp, east side of 11th St. bridge, west side of Sand Springs bridge

City Water Testing Issues

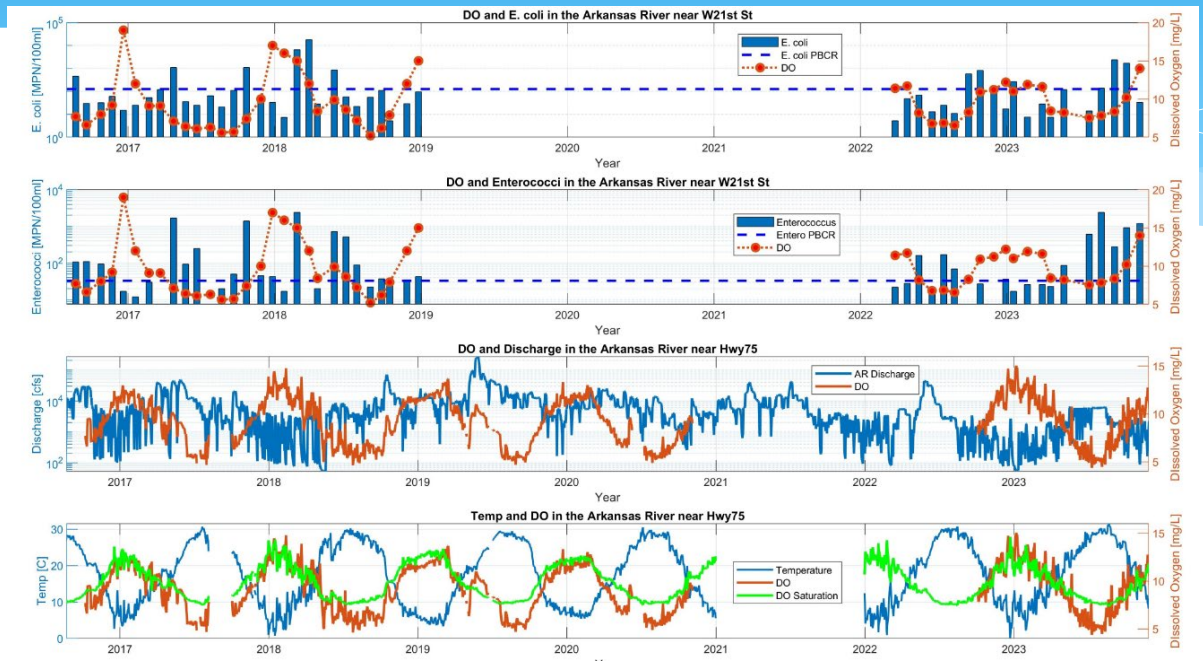
Water Quality Monitoring Parameters Plan

Analysis List	Minimum Frequency	Method	Results
pH	Twice per week	In field	Real time
Temperature	Twice per week	In field	Real time
Dissolved Oxygen	Twice per week	In field	Real time
Turbidity	Twice per week	In field	Real time
Electrical Conductivity	Twice per week	In field	Real time
E. coli	Twice per week	Lab analysis	24 – 36 hours
Enterococci	Twice per week	Lab analysis	24 – 36 hours
Dissolved Cadmium	Monthly	Lab analysis	4 – 5 days
Total Petroleum Hydrocarbon	Monthly	Lab analysis	10 – 14 days



* Five top items pH… are mostly irrelevant for recreation. Dissolved oxygen is important to fish but not people.
* Cadmium is not very important to recreation and previous testing has not shown it to be of concern for recreation
* Testing plan is not daily even though historic data for bacteria and hydrocarbons show levels can drastically change daily
* Bottom Line: The data that will be available to public on a website is an educated projected guess and is actually "what was" not "what is" or "what will be"!!!
* If the city website shows "green" on Jan 9 (as in above graphics), will it be safe on Jan 10-12? They wan t you to decide!!!

City Water Testing Issues



* If you look carefully at this slide that was quickly skimmed over quickly during the city presentation you will notice that many of the monthly tests in what will be the new lake, in warmer months, show bacteria levels that exceed the allowable standard level (horizontal dashed line) for accidental ingestion. Briefers did not even mention what the graphs show, especially bacterial levels that were high.

Benefit Analysis – High Level Competitive Rowing Venue

* City Claim: Will bring high level sports to New Lake and flume

Competitive Rowing

* Water is only about 10 ft. deep at dam and rapidly falls off in many areas just upstream due to silt and the bedrock river bottom.
* Water depth, length, and course straightness cannot meet national or international rowing standards that require:
  * Length needed: .75 to 1.3 miles (See course layout on map to right)
  * Constant width needed: 355 ft.
  * Minimum depth needed: 9.8 ft.
  * Dredging/excavation of river is required for this use and not budgeted for ($$ millions required to remove over 500,000 cu-yds of silt and rock)
  * 5-yr silt removal only planned for 500-ft upstream of dam. All other silt will remain.
* Alternative solutions: Competitive rowing possible upstream of Sand Springs if built or if new dam had been relocated and river deepened ($$ millions)

Canoe and Kayak Races

* Intl. Canoe Federation also requires a straight 1500m course
* 6 ft deep all lanes, full length
* Strict water quality requirements
* Would require frequent year-round testing
* New Lake exceeds these standards

b) Inland waters

ICF canoe racing water quality requirements

- PH between 6 and 9
- Enterococci: not more than 200 per 100 ml(ufc/100ml)
- E. Coli not more than 500 per 100 ml(ufc/100ml)
- The presence of Blue-Green Algal blooms/scum (cyanobatteria) with more than 100.000 cells/ml

If the water quality test shows values out of the tolerance limits as indicated above, the competition will be cancelled, unless the ICF Medical Committee permits.

Benefit Analysis – Water Flume

* Claim: Will bring high level sports to the flume

Water flume

* Recreational flume will not meet typical standards for white water competition let alone Olympic class competitions assumed by many
  * OKC has an Olympic class $45 million venue of treated water and methods to change the class of the course depending on complexity of competition
  * OKC already an Olympic training site and American Canoe Assoc. plan on moving HQ to there
  * Tulsa flume could only be used for low level local recreational competitions class II or lower if river cleaned up
  * Tulsa could never compete with OKC even if water is proven to be safe due to a comparative lower level of water class
  * Population served?
    * Questionable
      * (Local kayak club never consulted on the design and operations of new flume)

Cost: New flume $4 million + 5 years too late and $40 million short to compete with OKC

Water Quantity Analysis

Claim: Will finally provide nearly year round water in the river

* During low flow conditions in winter Dec-Jan and June-Aug water will stagnate as usual and possibly disappear during drier years
  * Recreational flume or any other activities requiring useful water depths will be unavailable
* The lake pool will visually appear exactly the same as the existing dam when full or during low flow conditions
* Pool will be very low or non-existent during fish migration Feb-May if operated as promised to Federal and State wildlife agencies
  * Level depends solely on releases from Keystone and normal rainfall
  * Fish can effectively spawn as they have for decades even with extremely low flows in the river
  * Additional times for full lake will not be realized until Sand Springs dam is built (Corps of Engineers report Feb. 2009, pg 44) and even then it is questionable.

Economic Benefit Analysis

Claim: Lake and flume will provide economic returns that will pay for the construction

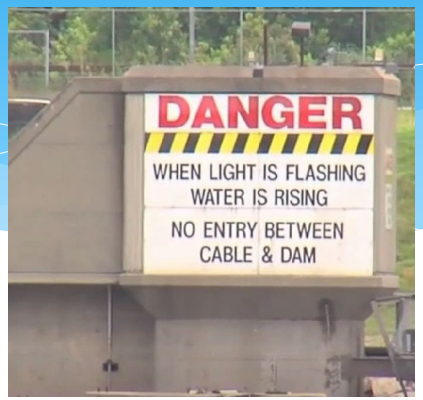
- The only econ study done was grossly inaccurate and hidden from the public prior to voting
  - Study based upon grossly exaggerated and unsupportable benefits envisioned by local business leaders and not facts
    - Economic flow of money into City hinged on holding competitive rowing, larger boat parades, triathlon (swimming in river), stand up paddle boarding, etc.
  - Even if study was factual, it would take longer than the economic life of the dam for tax revenues to pay for the dam at 0.3% to 0.8% sales tax revenue
- No factual or proven economic benefits beyond what we now see with the old Zink Dam

New Dam: Safety Claims

* Claim: Increase in safety to people or boats going over existing dam due to elimination of "roller effect"
* Limited truth
  * "Roller effect" will not be as significant over crest gates. Full height gates roller effect still probable with higher volume of water flowing over gates according to Zink Dam consultants. (youtube video Association of State Dam Safety Officials (ASDSO)
    * Hydraulic consultant stated that full height gates must be fully lowered when flows over top of gates to allow boaters to safely go over gate.
    * 2020 Operations Plan for the dam would allow large flows over all of the full height gates except when flows exceeded the rare value of greater than 40,000 cfs in river
      * Frequently flows will be high enough over gates to create a hazard

* **Hazard Summary**
  * Boats accidentally going over new gates can encounter equal or greater hazards
    * Extreme drops over full height gates of up to 11 feet
    * "Roller effect still present if gates not fully lowered when flows of about 1 ft. are flowing over gates.
    * Drops of 3 feet and serious head and body trauma going over crest gates if kayak overturns
    * Ingestion of polluted water

Other Safety Hazards



- **Remaining hazards**
  - Fishing Hazards
    - Anglers downstream of dam will still be subjected to rapid river rise when lake is full and power generation flows enter the lake
    - Warning system to anglers is a siren and a flashing light. Corps of Engineers standard design requires a loud warning siren audible for long distances downstream when flow conditions will change
      - Routine siren blowing on changing conditions will most likely be a nuisance but if turned off will leave only a flashing light that, in the past, anglers ignored.
    - Fishing will occur on downstream sides of dam on concrete surfaces of crest gate steps as in this 2024 photo due to easy access from east and west banks
    - Dam gates are computer controlled and can operate unexpectedly at any time. Are computer algorithms and controls failsafe? The city will not let experts review them!
    - Excessive policing will be required to keep anglers and people off the downstream side of gates
    - 24-hr security is only from video cameras. No budget for security patrols
  - Original estimate only provided equivalent for one-half time employee to operate flume gates for recreation

Refinery Levee and Flooding Impact

Flooding:

* The design of the new dam still causes the same unnecessary 1-2 foot upstream river rise as the old dam. This rise increases the odds of flooding at the Gathering Place and homes immediately north of the Gathering Place.
  * Unnecessarily increases water pressure on the Holly refinery levee.
  * Installation of 100% full height gates across the dam would have reduced this hazard
* Refinery levee
  * New lake elevation will place water on levee pump station flap gates resulting in higher maintenance for levee district
    * Without removal of silt over flap gate the pump station can be rendered functionless during a flood
    * Increased corrosion of pump turbines and flap gates
    * Increased pump operation to dewater pump station sump

Wildlife Benefit Analysis

* Claim: New dam will provide benefits to fish
  * Not impede spawning migrations like existing dam
    * True: Only if enforced by lowering large gates and draining pool during spawning season!
    * Old dam was supposedly designed to allow fish migration. However, it failed in this area by design.
  * New dam will help even out flows downstream of dam by providing minimum flows around 1,000 cfs for water quality
    * True: Only when adequate water available upstream so no real improvement will be seen
    * Construction of Sand Springs dam important to achieving more stable river flows
    * Dams can only provide a very limited amount of flow control due to limited capacity.
    * Historical river flow statistical data
* However:
  * "Water quality upstream will suffer during lower flows and impoundment of water during no flow" (Fish and Wildlife Service)
  * Lake pools for any length of time during spawning season will kill Striper eggs and other newly hatched fish
  * Probable frequent entrapment of fish in pools created in flume
  * Old dam operations have not been adhered to by River Parks Authority raising doubt on future effective management

Summary of Old Dam Issues

Old dam needed to be replaced or preferably removed

Existing dam:

* A safety hazard
* High maintenance from silt build up and corrosion
* By restricting water flow, it increases flooding probability for upstream homes and Gathering Place and increases chances of levee failures
* Historically has completely impeded fish migration and spawning due to defective design and mismanagement
* Old dam has not been operated in accordance with its established purposes

Summary of The New Dam Questions

Questions to ponder but some answers may be obvious

* Is the present design the best option to achieve meaningful benefits to Tulsa while meeting goals of public safety and wildlife support?
* Will the existing design meet all of the expectations of and promises to citizens who voted for it?
* Is the recreational flume that can only be used by a limited number of citizens and for a very limited amount of time during the year worth the investment?
  * Is it worth the risk to place public in polluted water and an unsafe environment?
* If the new lake will only be 3 ft. deeper than the existing lake, why was there no boating or other recreation on the existing 8 to 9 ft. deep lake in the past other than limited Tulsa Rowing Club practice?
* Why did government entities not maintain or operate the old dam for wildlife, such as seasonal fish passage, as promised?

More Questions

More questions to ponder

* Why was'nt the new dam designed like the proposed Sand Springs and South Tulsa dams with more large gates so as to reduce flooding hazards to the Gathering Place and homes north of new dam?
* Other than 3-ft deeper water at the dam, existing dam could have been modified to fulfill the same basic requirements as actual design of new dam by simply replacing existing gates with Obermeyer gates at a fraction of the cost
* Why did they not build the new pedestrian and cycling bridge right over the top of the new dam as planned and similar to the one planned for the South Tulsa dam? This would have provided more functional use for anglers, dam maintenance, and provided a better visual experience to pedestrians of the cascading water.

More Questions

More questions to ponder

* Why has the city totally reneged on the operation of the dam for fish passage and spawning by effectively cutting off fish passage for virtually the whole year?
* The city continues to expect citizens to be naïve enough to get in a river that always has been polluted with bacteria and petrochemical toxins.

Each citizen has to decide if this was truly worth the investment of $127 million for these dams and if the project fulfills their expectations or better yet, how many lies were promulgated.