

PRESCOTT WATER ISSUES
COMMITTEE MEETING
TUESDAY, MAY 7, 2010
PRESCOTT, ARIZONA

MINUTES OF THE MEETING OF THE PRESCOTT WATER ISSUES COMMITTEE held on Tuesday, May 7, 2010 in the COUNCIL CHAMBERS located at 201 SOUTH CORTEZ STREET, Prescott, Arizona.

A. Call to Order.

The meeting was called to order at 8:00 a.m. by Chairman Lamerson.

B. Roll Call.

WATER ISSUES COMMITTEE MEMBERS:

Chairman Jim Lamerson	PRESENT
Member Steve Blair	PRESENT
Member Lora Lopas	PRESENT

Councilman Blair and Councilwoman Lopas arrived late, approximately 8:05 a.m. and 8:20 a.m.

Resource from public

C. Approval of the minutes of the April 16, 2010, Water Issues Committee meeting.

Mr. Budinger noted that his name was spelled with one D not two T's.

COUNCILMAN LAMERSON MOVED TO APPROVE THE MINUTES OF THE APRIL 16, 2010 WATER ISSUES COMMITTEE MEETING WITH THE CHANGE THAT WAS MENTIONED; APPROVED BY COUNCILMAN BLAIR; PASSED UNANIMOUSLY.

D. Discussion of Arizona Department of Environmental Quality water quality requirements for the lakes.

Mr. McConnell noted that when the committee met on April 6, 2010 there were some materials distributed which included the lake operational plan and some water quality characterization that had been done for Watson and Willow Lakes. The next meeting they gave out additional reference materials, including a CD of the water quality work that had been done by Civiltec. They also pulled historical information from appraisal reports for the reservoirs. He said there were 2 types of criteria they had to meet for the lakes

1. The water quality within the lakes themselves for Arizona Department of Environmental Quality (ADEQ). They were continuing to do some water quality characterization studies for each of the lakes with the objective to determine pollutants and moving on to setting some standards.
2. The discharge permit for the recharge facility. Water was released from the lakes, which traveled down the recharge line by the airport. There were specific requirements for the storage permit.

He noted that the United States Environmental Protection Agency (USEPA) had a different perspective from that of the ADEQ. ADEQ saw the lakes in a particular way and categorized them. When it went up the chain to the EPA, they applied different requirements and categorized the lakes in a different way.

In respect to the recharge, the City of Prescott met their quality requirements for the water that was released to the recharge. From the water supply recharge standpoint, there was not an issue. That did not mean that EPA would not adopt additional standards in the future for surface recharge or recharge they had in their waste water treatment plants.

They were in a period of waiting to see what ADEQ came up with concerning their studies on the lakes. The City was continually in the status of testing and monitoring their water quality going down to the water recharge facility. Beyond that, it became a matter of what the objectives were.

Chairman Lamerson said that was good news. Between the creeks and the lakes the water standard was being met. He did not think that any report was in conflict to what they wanted to do. They should prioritize their objectives and send something to the Council. He said that they thought they knew what they were trying to accomplish with tourism as an economic engine. Maybe that could be to lessen the blooms or work with ADWR on water release. He thought that they should find out when they could release the water to meet the objective of Salt River Project (SRP).

Member Blair said that education was important and they should determine whether they wanted to put signage at the boat ramps to talk about the algae. Mr. Worob said that they should find out what type of algae was in the lakes.

Chairman Lamerson said that perhaps they should get someone from Fish and Game in there for the next meeting. Ms. Horton thought that it would be a good idea because she did not think that they had ever had any conversations with them about any objective other than getting game fish.

Mr. Budinger asked about what type of monitoring they might want. Chairman Lamerson noted that Fish and Game was already monitoring the lakes and he

would like to hear from them. Mr. Worob said that Andy Clark was high on the list of speakers. He asked when everyone could meet again.

Chairman Lamerson noted that staff was committed to once a month, which did not mean that they could not meet on the side. Member Blair said that the lakes were important to him and the sooner they got those things done, the better. He thought that the presentations could continue even though everyone could not attend.

Mr. Byrd noted that the working group had put together a road map that he wanted to run through.

1. Purpose statement, why they were there, referring to Gary Worob, Gordon Bean, Chuck Budinger and Michael Byrd.
2. Collection and review of data through presentations by summer 2010.
3. Identify strategies by winter 2011
4. Lake improvement and stakeholder involvement by summer 2011.
5. Presentation to City of Prescott Mayor and Council.

Chairman Lamerson said that it sounded like a reasonable thing to approach. However, when Council went into budget, they would be looking at hiring a Tourism Director around August. The Council would lay out priorities and objectives. He would have liked to get something before Council from a water issues perspective so that the Tourism Director would hear from folks in the community. He hoped that the presentation to Council would be in July. They could talk about water release issues and objectives that they would be working on which would all be on TV and could act as some of the public education they had talked about.

Member Blair said that they should do the workshop on the off Tuesdays.

Mr. Worob said that it was a powerful plan and the committee had volunteered themselves to push the plan forward and look at funding sources. They did not have a clear understanding of the scope of the problems. Member Blair said that the community should know that the lakes were healthy and that the City was continuing to put fish in them and also what the fish did for the lakes.

Member Lopas said that the City needed to show the public that they were proactive on water quality.

Mr. McConnell noted that the work of the group was good and that he wanted to see a copy of their plan at the next meeting. He heard an interest in a presentation before Council and in describing a roadmap. With respect to the budget, he noted that Mr. Worob was correct and that when they applied for grants and budgeted for

projects, they needed to work through the objectives and price them out. The timeline that was outlined was consistent with the next budget process which began in January and February 2011.

Member Lopas agreed. Chairman Lamerson noted that the public needed to hear the truth and the fact that there were things that were being looked at that may or may not affect the upcoming budget.

Mr. Byrd noted that there would be a need for some level of technical support. They had an ad hoc working group of four people, two of whom had full time positions with limited time. He did not know if the City had personnel that could be assigned to that or if there was a partnership opportunity with one of the colleges. Chairman Lamerson said that it was a serious issue and important for tourism. They needed a workshop for the Council.

Member Blair thought that two weeks from Friday would be a good time for the next meeting.

Mr. McConnell noted that his commitment to a monthly meeting was with reference to supplying resources. It did not mean that he would not be available to listen to a good speaker.

Ms. Horton said that she would call Fish and Game and set up a meeting and see when they were available.

Mr. Worob asked if they could get a copy of the study of the lakes before the next meeting.

Chairman Lamerson said that there would be a meeting in two weeks on Friday May 21 and Friday June 4.

Ms. Horton said that the speaker may not be available at that time but they would get the meeting as close to two weeks as possible.

Mr. McConnell noted that they wanted to hold a separate meeting to talk about subdivision plats and water allocation on or before May 20th or 21st for the Council ad hoc committee. They needed to talk about the Tenney homestead subdivision and budget for water conservation which had a reduction in incentives. There was a discussion on dates and times for the meeting.

Chairman Lamerson noted that anything that had to do with conservation issues was appropriate for the Water Issues Committee as a whole. He also said that the public should be involved if they were going to reduce incentives for water conservation.

Mr. Worob said that he had heard that the recharge requirements had been met and the lakes would not be dropping much. He asked if that was true.

Mr. McConnell said that, to his knowledge, they were sending water from the lakes to the recharge facility. It was the annual window for recharge. If they recharged too much and there was no monsoon then the lakes would be too low.

E. Presentation by Jay Crocker of Prescott Creeks on *How Lakes Function*.

Michael Byrd introduced Jay Crocker who was the Field Projects Coordinator for Prescott Creeks. Mr. Crocker delivered his presentation (Exhibit 1)

Mr. Crocker said that he worked for Metropolitan Water District, a huge importer of water in Southern California which was similar to the Central Arizona Project. He worked on a team that managed the reservoirs.

VARIABILITY IN LAKES

Physics

Light heated the water and drove photosynthesis.

Wind blew across the surface of the lake and grabbed the surface water and pushed it in the direction of the wind. It made the water deeper on one side and forced the water to circulate and mix.

ANNUAL CYCLES

Spring – The ice had melted and the water was cold and the same temperature throughout. The wind would mix very deep with equal temperature and chemical parameters.

When more light penetrated the lake, the water got warmer and was more buoyant, less dense. The wind would have less of an effect because it would not push warm water across lake. The water below would remain cold.

Summer- There were three layers of the lake. The epilimnion, or top layer, became thicker as it got warmer. There was no chance of mixing down. The plant growth was in that area due to photosynthesis.

The metalimnion was the middle layer where the temperature changed rapidly with the depth. Warm water would not mix down through the layer and cold water could not work up.

The hypolimnion was the lower level and was the coldest.

Fall – The reverse situation occurred.

The temperature in the top layer began to drop. It became close to the temperature in the middle layer and the wind could mix both layers. Both layers would approach the temperature of the bottom layer and then all of the layers could be mixed by the wind and the chemistry would also be mixed.

Winter – When surface water reached 39 degrees, it was at its most dense state. As it moved towards freezing, the water was less dense.

The lake ended up with a layer on top that was colder than the layer below it. Without ice, the wind could continue to mix the lake.

Chemistry

Spring - In the spring there was a lake that was pretty well mixed.

Chemicals were mixed and there was as much phosphorus as there was going to be. When spring light increase happened, all of the plants had what they needed to begin growth. They pulled the nutrients into their cells and depleted the phosphorous.

Summer - Moving in to summer, it would start the stratification cycle. The temperature at the surface was warm. The photosynthetic activity would occur when light came into the top layer of the lake. The plants would crank out oxygen. The oxygen would increase in the top layer due to photosynthesis.

Light did not get into middle layer so decomposition used up oxygen and oxygen started to drop as they went deeper in the lake. The lower layer had no sources of oxygen.

Because oxygen was non existent at bottom of lake, phosphorous was created and highly saturated the lower level. Nitrogen and phosphorous were the most important nutrients to plant growth. In a typical lake, nitrogen was plentiful and phosphorous was lacking as far as plants were concerned, which would stop algae growth when it was gone.

Phosphorus input came from outside rain and run off. There was more phosphorus in the top layer and algae would bloom. It is common in a lake with high nutrient levels.

Fall - There was a turnover and the layers broke down. The dissolved phosphorus from the bottom was mixed into the lake. Algae did not normally bloom at that time of year due to the limited light.

Winter - If there was an ice sheet, the whole lake would be isolated from wind energy to mix it and the oxygen. Two things could happen at that time. It could increase the phosphorus loading from the bottom of the lake and there could be a winter fish kill.

That was all referred to as Internal Loading or Nutrient Cycling. All nutrients taken on in summer went to the bottom of lake in winter. The whole process drove the bottom of lake to become low in oxygen. Streams were usually high in dissolved oxygen. They brought nutrients from the landscape to the lake. Heavily forested areas were low in nutrients. Lake Tahoe could stay algae free because of lack of nutrients.

Leaking septic systems, road run off and urbanized watershed could have ten times more nutrient loading than a forested watershed.

Biology

Lake Zones were driven by light.

The Littoral Zone was anywhere the light could penetrate the lake. Algae would attach to the plants and small fish would eat algae. It was a very active, important zone.

The Limnetic Zone was where algae and floating plants can grow. That was the area where oxygen in produced. Food was from dead organisms that had fallen down from the top zone.

Chairman Lamerson asked if that was why the fish had spots and looked bad in Lynx Lake. Mr. Crocker said that he did not know why that would happen.

Member Blair asked if water in water out was a direct correlation to the health of the lake. Mr. Crocker said if water was flowing through the lake at a good rate, it should turnover in two months. Flow through can be a road to keeping the lake healthy or killing the lake.

Member Blair was trying to figure out how it worked with cleaning the creeks. Mr. Worob noted that sometimes Watson Lake had no water coming in to it but there was wind. He asked if it was helpful to have more wind.

Mr. Crocker said that the nutrient levels in the top layer of the lake would remain the same whether it was mixed by wind or not, during the summer.

Mr. Crocker discussed aeration. If they wanted to disrupt algae blooms and they put a device at the bottom that pushed the water up, it would force that algae down and it would die. It was very hard to cross the middle area. If they used the device in a lake there would be a local effect. Watson would work against the device because

the shoreline was so jagged and uneven. It was really difficult to get desired results in anything but a three foot deep city lake. It could also be used well in a golf course.

Circle bubblers would mix the top and middle layers. If the middle layer got algae out of the light, it will kill the algae. Bubblers were energy inefficient because water just slipped around the bubbles. He suggested that they try to make the bubbles as small as possible, approximately 1mm. To blow those types of bubbles they would need a small tube which caused restriction in the system. There were devices that were like big propellers which he had seen used that would be more energy efficient.

Mr. Budinger asked what happened to stratification and composition of a lake when the top layer got skimmed off for release. Mr. Crocker said that if the top layer was decreased, they would be growing it as fast as they were shrinking it due to the sun. It was better to decrease the lower level to help keep the nutrient levels down.

Ms. Graser said that they released water from the bottom at Watson Lake. Mr. Crocker said that it was better to drain the lower level during the summer and as fast as they could in the fall. Mr. Budinger asked if there were a time that they would take it from the top.

Mr. Crocker said that if they can take water off the bottom and the top, then they had the ability to select how to drain water from the lake for the best quality purposes.

Mr. Worob asked what they should do if they could not choose where to drain the water. Mr. Crocker said that the problem was increasing nutrients from outside the lake. If they could be decreased by a significant amount the lake would get back to balance.

Chairman Lamerson asked if he was talking about water coming in from Granite Creek. Mr. Worob was concerned with the paved slope at Watson and Willow Lakes. Mr. Crocker said that the effect to the lake from the runoff was minimal.

Mr. Blair said that the health of creeks was most important. He asked if the sewer leaked in the creek, how far it had to go in the sand to get cleaned. He noted that the sewer lines should be healthy. Mr. Worob wondered how much the magnesium chloride that was used on the roads affected the lakes.

Mr. Budinger said that the Arizona Department of Transportation (ADOT) used chloride, sand and gravel. He had read reports that the effect was minimized not far from the road. Mr. Crocker noted that the lake would have magnesium and chloride in it. Member Blair noted that imbalance due to the sun and not the sewage.

Mr. Crocker said that the source of nutrients did not matter. The raw sewage was loaded with e. coli and that was dangerous. He said that they had to break the cycle of nutrients, water and light. It was hard to break water and light, so they could only attack the nutrients outside of the lake or withdraw the water from the lower levels.

Chairman Lamerson said that they had to prioritize their objectives for lakes. One of the priorities was for recharge. A healthy lake could mean different things for different reasons. Some lakes may not be for fishing. They could not try to redesign the desert and expect it to work

Michael Byrd said the presentation was good in describing a set of natural systems, the lake and the watershed. They were trying to manage the systems without a full understanding of how they are currently working. He asked if they knew enough about how Watson and Willow Lakes were functioning. He also asked what they needed to understand better to approach solutions with a broad prospective.

Mr. Crocker said that in a lake management program, monitoring was first. They needed to know temperatures during the different seasons and the extent of dissolved, oxygen and phosphorous. It was basic. The lakes will be different every year. They will not be able to establish patterns for decades.

Chairman Lamerson said that they should look at it in multi-phases. The Council had been very specific that they wanted to target tourism as an economic development tool. They may not be able to monitor everything while they developed their tourism but they may be able to measure certain things to obtain certain objectives.

Mr. Crocker said that the program needed to be ongoing and they should try to determine where Watson Lake fit in with the generalized models and look at tools like selective withdrawal, mixing, and managing the watershed which was what Prescott Creeks was all about. They started their watershed improvement project, monitoring and inspecting for broken sewer lines, leaky septic systems, etc.

Chairman Lamerson noted that they wanted to use the lakes to their best advantage.

Mr. Bean noted that a lot of the lake exposure was in the shallow ends. He asked how they might improve the public impression of the weeds, which did not mean that it was a bad situation. Mr. Crocker said that it may just be educating the public as to what lived in the weeds and why they were needed. If the weeds were impenetrable by fisherman, they might want to lessen them. If there was an area with a lot of growth and doing a good job, they should let people know that it was a good thing. Member Blair noted that certain fish would reduce the weeds and wondered what they had done to identify those types of fish.

Ms. Horton said that the Arizona Fish and Game Department had been doing studies and they put two to three types of catfish in Watson Lake. They wanted to take one out because it was doing more harm than good.

Mr. Legler said they were studying Watson Lake hard and had put some blue gill in Willow Lake. Mr. Worob said that they needed Fish and Game there to educate them. Member Lopas suggested that the Forest Service also be there.

Mr. Byrd said that the committee started to draft a road map; where they needed to go to improve the lakes. (Exhibit 1) He thought that it was a good start to have Mr. Crocker come in and give them a foundational understanding of the lakes.

F. Update on potential grants.

Mr. Worob noted that he taught a free workshop in the library for researching foundation grants and he would be happy to look for what might be available when they identified their goals and objectives.

Ms. Horton said that Eric Smith was Superintendent of Special Projects and in charge of writing grants for her department and Tim Legler was the Parks Superintendent and took care of lakes.

G. Adjournment

There being no further business to be discussed, the Water Issues Committee meeting of May 7, 2010, adjourned at 10:01 a.m.

JIM LAMERSON, Chairman

ATTEST:

KIM WEBB, Assistant City Clerk