MURRAY
CITY COUNCIL

MURRAY CITY MUNICIPAL COUNCIL
COMMITTEE OF THE WHOLE

The Murray City Municipal Council met as a Committee of the Whole on Tuesday, February 17th, 2015, in the Murray City Center, Conference Room #107, 5025 South State Street, Murray Utah.

Council Members in Attendance:

Blair Camp, Chair	Council Member, District #2
Diane Turner, Vice-Chair	Council Member, District #4
Jim Brass	Council Member, District #3
Brett Hales	Council Member, District #5
Dave Nicponski	Council Member, District #1- Excused but arrived late

Others in Attendance:

Ted Eyre	Mayor	Janet Towers	Exec. Asst. to the Mayor
Janet M. Lopez	Council Administrator	Tim Tingey	ADS Director
Jennifer Kennedy	Recorder	Frank Nakamura	Attorney
Doug Hill	Public Services Director	Kellie Challburg	Council Office
Jennifer Brass	Resident	Danny Astill	Water/Waste Water
Steve Roberson	Resident/Fire	Thomas Holstrom	Central Valley Water
Phil Heck	Central Valley Water		

Chairman Camp called the Committee of the Whole meeting to order and welcomed those in attendance, and excused Mr. Nicponski for his absence.

Approval of Minutes

Chairman Camp asked for approval on the minutes from January 20, 2015. Mr. Hales moved approval. Ms. Turner seconded the motion. All were in favor.

Business Item #1 **Central Valley Water Reclamation Discussion- Jim Brass & Danny Astill**

Mr. Astill introduced Tom Holmstrom, the General Manager of Central Valley and also Phil Heck, the new Assistant General Manager.

Mr. Holmstrom said he appreciated the opportunity to discuss the opportunities and challenges that Central Valley is facing. He is presenting this same information to all of the seven member entities, and this is the fourth one thus far. Ms. Turner asked who the seven entities were. Mr. Holmstrom answered: Granger-Hunter Improvement District, Kearns Improvement District, Mount Olympus Improvement District, Murray City, Cottonwood, Taylorsville, Bennion and South Salt Lake City. There are two municipalities and five special districts as part of the seven member group.

Mr. Holmstrom stated that the Federal Clean Water Act passed in 1972, and the goal was fishable and swimmable waters. It was called secondary treatment then, and was required and permitted. Central Valley formed its interlocal agreement in 1978, and consolidated five districts and two cities. There were five waste water treatment plants along the river that were overloaded and outdated and so were consolidated to a central permitted location. The permitted parameters at that time were BOD (biochemical oxygen demand), which is a measure of the waste load. It was a five year permit cycle involving total suspended solids, ammonia, total coliform, and total residual chlorine.

When Central Valley was under design there were relatively low ammonia limits and it was designed as a trickling filter-activated sludge plant. Central Valley was able to get the State and EPA (Environmental Protection Agency) to back away from those ammonia limits and the plant was re-designed as a (TFSC) trickling filter solids contact process. That process has saved a lot of money over the last thirty years, but now comes with a price, due to the fact that there are certain things that a TFSC will not do.

The current issue is nutrients, specifically nitrogen and phosphorous. Nutrients are not a new issue, and first emerged around the great lakes region in 1970's. The East Coast and Chesapeake Bay came under scrutiny in the 1980's-1990's and now the Mississippi basin and Western states are currently under the microscope. The State of Utah is scrutinizing the process and pushing for phosphorous and nitrogen limits over the next ten year period.

Central Valley joined the Jordan River/Farmington Bay Water Quality Council in 2008 to study the science behind the nutrient issue. They were able to successfully combat nutrient limits based upon Jordan River impairment. Currently, they are focusing on the impounded wetlands surrounding the Great Salt Lake and the loss of habitat and diversity. Central Valley contributes approximately $150,000 per year towards scientific endeavors to demonstrate that there is or isn't impairment, due to these nutrients.

The State's nutrient strategy is one of adaptive management and they have established technology based limits, primarily with phosphorous. The State just sent a certified letter stating that the Water Quality Board has passed a technology based limit of 1.0 milligrams per liter phosphorous coming out of any mechanical treatment plant in the State of Utah. This phosphorous limit has been driven primarily by EPA, and is essentially the State's olive branch at this point in time to keep from having total inorganic nitrogen limits imposed.

He stated that phosphorous is a conservative pollutant which forms various compounds and moves but never disappears. Nitrogen, on the other hand will form compounds but eventually oxidizes and disappears into the atmosphere. He said they believe that phosphorous is not easy to combat because of its conservative nature. It can't be proven that it is harmless, or it can't be proven that it is harmful, but the conservative approach

is to impose a limit on it. The jury is still out on nitrogen and he believes that sound science will demonstrate that it is not detrimental downstream. The State of Utah did a cost benefit analysis on the phosphorous limit and studied each mechanical treatment plant in the state, including Central Valley. Their conclusion at Central Valley was that they could get at the phosphorous using chemical precipitation at a capital cost of about $1.7 million and an annual cost of about $1 million. This information was published in a technical memorandum specifically for Central Valley in 2009-2010.

The State also did a benefit analysis which included recreational dollars, cleaner appearance of water, and the sales of fishing licenses. They came up with excessive benefits to counter these costs.

Central Valley is in the five year permit renewal process, and the permit actually expires at the end of the month. He believes a new draft of the permit for consideration would arrive in April. They are now waiting for a draft waste load analysis.

Another issue besides the phosphorous limit is the point of discharge. For the last 25 years, the waste load allocation has been drawn up, as if it was discharged at the Jordan River, complete with a dilution ratio of about 47%. They would like to rewrite that because the discharge point is actually 2000 feet up in Millcreek, but was considered to be a backwater influence and part of the Jordan River. They want to revisit it and protect Millcreek but the dilution factor increases to 96%. They would try and draft lower ammonia limits into the toxicity testing which is called bio monitoring. The study shows with the higher dilution ratio, they would most likely fail 50% of the time, if they consider Millcreek as the point of discharge. They are in pretty good shape as far as the metal limits.

There is a five year compliance period on the new phosphorous rule, and Central Valley is just trying to debate the point of discharge with the State. A 2000 foot pipeline has even been considered at an approximate $6 million cost to ensure the point of discharge into the Jordan River. It would still be considerably less than the lost capacity value of the plant.

Mr. Brass asked if the ratio was 96% in the last 2000 feet in Millcreek, what would happen to the impact on Millcreek. Mr. Holmstrom agreed and said he told the State about the pipeline possibility and they were fearful because they know that Central Valley sustains the lower section in Millcreek. The State recognizes that they are being tripped up by a regulation that would not do Millcreek any good.

In addition to the study done by the State's consultant, Central Valley brought in an outside consultant to look at optimizing the plant in its current form to remove nutrients. That study was completed in 2013 and concluded that chemical precipitation in the phosphorous was probably the technology to use and could get to a 15 total inorganic nitrogen content, with different flows splits through the treatment facility.

There was also a Jordan River/Millcreek hydraulics analysis done to demonstrate that the Jordan River does in fact back up past the point of discharge in Millcreek, and therefore piping it doesn't really do anything. There was a sustainability analysis of Millcreek to demonstrate what Millcreek could attain, as far as water quality and habitat. and it showed it is still less than what it is, with the flow into it. He stated that Mr. Heck did a WET (Whole Effluent toxicity) test and history and variance report to demonstrate

to the State that if they discharged to Millcreek, they would fail the WET test at least 50% of the time. Mr. Heck said the WET test is a quarterly test and is a week long process involving taking samples daily and sending them to the lab. The lab grows a type of minnow and looks at reproduction and other things. It is an expensive test and costs a few thousand dollars per test. Mr. Heck said when the flow is diluted by the Jordan River, they typically pass the test. They also test the undiluted effluents and fail about 50% of the time if it is undiluted. Once an entity fails the test, more frequent testing is required, until you reach so many passing results and can get off the continuous testing cycle. He added that if the point of discharge is Millcreek, it could be a very long cycle of continuous testing.

The other part of this is that they would require a toxicity identification evaluation that could cost hundreds of thousands of dollars. That involves biological and chemical testing to determine the reason for failure. It is very hard to pinpoint the cause for the failure on a daily basis. Mr. Brass commented that the tests are so expensive it justified looking into a $6 million pipeline. Mr. Holmstrom agreed and added that the de-rating of the plant would be costly also.

Mr. Heck said the ammonia limit would de-rate the Central Valley process by about 15 million gallons per day (mgd). Currently, it is a 75 mgd rated capacity and that would drop to about 60 mgd. That has a value of at least $30 million.

Mr. Holmstrom stated that last year, they embarked on a full scale chemical precipitation study to verify the State's report and claims. They received the lab data back in December and it turns out the chemical dose regarding phosphorous is about four times more than the State consultant estimated. The capital cost impacts of that dose are much higher than the State estimated. He stated that before reaching the phosphorous with this chemical, other chemical sludges are created that are not bio-degradable and do not contribute to the process. Handling all the additional solids create downstream capital costs. It could be an $8-$10 million cost to handle these solids. The annual O & M for this higher dose and handling these solids increases from $1 million to $3-$4 million because the solid increase is significantly higher. Mr. Heck explained the process of chemicals building up to phosphorous, and the creation of solid sludge. It results in a 35% increase going into the digesters, and the solid would not be digestive, resulting in 60-70% increase in solids out the back end. Typically, they get rid of about 50% of the solids in the digester. This also affects the ability to compost because the phosphorous produces a chemical that is not desirable to land application. Mr. Brass commented that the compost is a good revenue source, and sells for about $45 per yard. This information was not included in the State's report.

Mr. Holmstrom said they show a 30 year present worth with the chemical precipitation of about $70 million. He believes there are other options using biological processes. The biological process would have a higher up front capital cost but a much lower O & M (operations and maintenance) cost year after year. They believe an engineering evaluation this year would be appropriate to ferret through these issues and decide the best course for Central Valley. Mr. Heck said an immediate response is needed and the clock is running. The biological process would require a lot of construction and design to switch flows, he added. Mr. Brass commented that this is going to happen; the overall cost is just not yet known.

Mr. Holmstrom said the intent is to find the $300,000-$400,000 needed for this year's study without re-opening the budget. Ms. Turner asked if the overall impact would be financial. Mr. Brass replied that was correct and worst case scenario, could cost up to $1 million per year for Murray City's share.

Mr. Heck showed a flow schematic of the trickle process. It is called a trickle and flow through solids contact. He described the pattern of the flow. He said this flow pattern gives a phosphorous range of .4 to 1 milligram per liter which would meet the new requirement.

Biological phosphorous removal takes the trickle and filter part of the process and replaces it with the contents of the blue box. The upfront primary clarifiers would remain the same but additional phosphorous release tanks (aerated sludge tanks) would be needed. The existing sludge tanks could most likely be incorporated. The existing aeration tanks have about 1-2 hours of holding or aeration time. This new process would give a 5-10 hour holding time. The tanks are substantially larger and account for a lot of the increased cost. The secondary clarifiers would fit in this process as well. In this case, the effluent phosphorous would come through the primary clarifiers and a small amount would be removed. It would be consumed by the biomass which is able to absorb and take up phosphorous. It then goes to the sludge digestion process systems. There would not be any additional sludge generated, not more than is currently being generated. It produces a waste sludge that is more valuable as a fertilizer product. This is why the biological process should be looked into possibly over the chemical process. The main disadvantage is the higher upfront cost, but the lower O & M cost over time is appealing.

Mr. Holmstrom said an aspect to consider is whether bringing external sources of materials in to the digesters would help create a carbon source to drive the biological nutrient removal. Nationally, it is being intimated that water treatment plants are not just waste water treatment plants but resource recovery plants. Currently, over half of the electricity and heat at the plant is produced with the methane gas from the anaerobic digesters.

He said they thought about changing their mission statement to *Central Valley's mission is to improve Utah environment by treating waste water*, and adding *recovering resources safely, efficiently and sustainably.*

Currently, there is unused digester capacity, stated Mr. Holmstrom. An RFP was issued in 2013 to select a consultant team to look into this in more detail. He said there is a possibility that bringing materials into the unused digester space could create more methane gas, generate more heat and electricity, and provide a carbon source for biological nutrient removal.

Mr. Heck showed another schematic of the resource recovery project. They would look into importing FOG (fats, oils and greases), mostly material pumped from restaurant grease traps and industrial food processing material. There is a company called Momentum Recycling that services larger restaurants and grocery chains. They collect a lot of food material. Currently, they cannot collect dairy, meats and fats, only vegetables and bread. They would like to bring the dairy, meat and fats to Central Valley and put it in the digester. Mr. Brass asked if the digester would consume almost all of that. Mr. Heck said that was correct because it has a high carbon content and carbon forms the methane gas. Particularly, 98% of oils and grease turn into methane gas. Chairman

Camp asked if this type of commercial venture would subsidize the residential costs. Mr. Heck confirmed it would. He said they would receive tip fees from those sources. He said it has been proposed to have a pre-treatment process of pasteurization. It is heated up and that starts the breakdown of this organic material. It goes to the digesters and is converted to gas, and the gas would go to the engines and generate power or could also be sold. It could be sold as green bio gas which sells at a premium cost.

Another part of the resource recovery was to have a side stream nutrient process to recover nutrients. That would be needed if biological phosphorous removal was being done. The other synergy between the two projects is the organic carbon supplement. That process is driven by the volatile fatty acids. This could result in a potential side stream that is diverted. Mr. Holmstrom noted that typically a carbon source, such as methanol is purchased. Mr. Heck said that after the primary clarifiers, there were about 70-80 milligrams per liter of soluble BOD, and about 5 milligrams per liter of phosphorous. The ratio for really good Bio-P removal is about 25 to 1. We are a little short, but there is a source that could help drive the Bio-P process, and make it work more efficiently.

Ms. Turner asked what is the cause of phosphorous, and if it is a by-product. Mr. Heck replied that in the seventies, phosphorous was put in detergents and other products. There is still a little remaining in those types of products. At that point, most waste water plants had about 8 to 10 milligrams per liter. Now it mostly comes from the food that we eat and is just a by-product. It is something that will not improve even with further regulation.

Mr. Holmstrom added that if the resource recovery project was going to move forward, there are some issues to be addressed. One issue is the interlocal agreement. Right now it does not embrace resource recovery. If they enter into an agreement with a private firm, partnerships are not allowed. There must be certain off-ramps in place to ensure inappropriate risks are not taken, and financial protections are in place.

These issues have been put in abeyance while the nutrient issue is tackled, he noted. Mr. Astill added that the resource recovery process leads up to the idea that the plant could be more efficient and recover some of this energy. It could help offset some of the costs of the plant. This new rule for phosphorous and the limitations and effect on the plant is unknown without a complete study. He has heard numbers ranging from $50 million to $110 million to make this change and remove the phosphorous. There would be additional operating costs also, he added. If the amount is $110 million, the cost for Murray would be over $11 million. He did some early calculations with Mr. Zollinger and it was decided that the sewer bills would probably increase by a third. There would also be ongoing costs for the plant.

Mr. Astill said the costs could be offset by some of the energy recovery, but without knowing the total cost for phosphorous removal and the additional carbon required, the suggestion is to move forward with an engineering study.

Mr. Brass said that any increase in Waste Water impacts the citizens; they do not view it as an enterprise fund. He asked if the plant needs to be rebuilt to a degree, is it more cost effective to do the infrastructure for resource recovery at the same time. He said some of the material would be needed to be brought in any way to make the biological process work. This action against the plants is not going away so there needs to be

creative ways to offset the costs, he noted. He stated that Murray has a history with other entities that have cost the City millions, and is a little gun shy. He believes there is a market for gas and believes it could be sold. He added that there are a lot of entities that would take green gas to be politically correct. He agreed that they need to determine the numbers and what the actual costs would be. He said that it is a confusing topic but the plant is very well run.

Mr. Astill said that nitrogen hasn't been mentioned and believes it should be included in the study, in case it has a similar effect. Mr. Heck said it is his understanding that within five years a similar letter would come regarding total inorganic nitrogen. He said as Mr. Holmstrom has said, studies could be done on the Jordan River and show that it is denitrified and comes out into the atmosphere. He has heard that the one phosphorous limit and ten nitrogen limits are interim limits and the EPA will set much lower limits 15 to 20 years later. There would be years of additional studies and evaluations to drive the limits even lower. One advantage of the biological process is that it can be set up to address nitrogen, where the chemical process would have no effect on nitrogen. That money spent on chemical would essentially be lost if trying to combat nitrogen limits also.

Mr. Heck said that down the road, the limits could be .5 phosphorous and 3 nitrogen. That is the second tier in the State's study. There needs to be a sequence of actions to reach the different levels. The plan needs to reach twenty or twenty five years out.

Ms. Turner asked what advantages the chemical process would have, when it seems like the biological process makes more sense. Mr. Heck replied that the upfront cost is cheaper and it was easy to ignore the solids coming off of it. He said that you can actually google the comparison of costs between the biological phosphorous removal versus chemical phosphorous removal. He said that 70% of the costs for chemical phosphorous removal is removing the solids.

Mayor Eyre asked what the timeline is for making a decision. Mr. Holmstrom replied regarding phosphorous, the plant has to be compliant by January 1, 2020. The compliance schedule for nitrogen is 2025. Mr. Heck stated that a study needs to be done so a decision could be made by this fall. A design budget would need to be put together and that could take a year. That only leaves three years to build it and get it operational. He said they could possibly ask for an extension if there is a plan in place. Mr. Holmstrom said it was possible to get another two years, if the plant was on the right trajectory.

Chairman Camp asked if other plants were in the same situation. Mr. Heck replied that every single plant in the State received the same letter. Mr. Brass commented that there are some smaller plants that can't afford to make these changes. Mr. Brass said that Central Valley has an advantage that the two men here today were involved in the design and construction of the plant.

Mr. Astill noted that it will cost a lot of money to do the work on these plants, and still will not change the composition of the water. Mr. Holmstrom said that the EPA has agreed that 70% of the nutrient issues come from non-point sources, such as agricultural runoff and golf courses. He said the EPA has noted that waste water treatment plants are the low hanging fruit and being targeted.

Ms. Turner asked if a partnership could be formed with the other plants for the studies that need to be done. Mr. Holmstrom said there was a discussion of nutrient trading with other plants. Mr. Astill noted that each plant is so individually operated and constructed and needs to be looked at independently. Even though there are similarities, there are too many differences. He said research could be shared and that is currently being done with the group that they are involved in.

Mr. Holmstrom said there are plants out there that can make this change much easier than others. Those plants have been expending a lot of energy in fully aerobic processes. Central Valley has benefitted from energy recovery and has run a very energy efficient operation for the last twenty five years. The treatment plant is simply not set up for nutrient removal at this point. Mr. Heck commented that there are a number of plants that are in a very similar position as Central Valley.

Mayor Eyre noted that the EPA imposes these regulations but doesn't offer any financial assistance. Mr. Holmstrom said that was correct. Central Valley was built in the eighties with about 50% Federal funds, but that money has since dried up. That is one reason they are trying to come up with creative revenue to offset some of these costs.

Chairman Camp asked about the worst case scenario on rates, and if the 30% increase to rates, included any O & M costs. Mr. Astill said that it is difficult to say not knowing the numbers, but there would be on-going maintenance costs for the entities. Mr. Heck said that the biological process would be more expensive than the current process annually, but not substantially more.

Mr. Brass invited everyone to tour the facility if they wished.

Chairman Camp thanked them for their presentation, and also announced that Mr. Nicponski had arrived at 6:10.

Announcements- Jan Lopez

On February 23rd at 9:00 a.m., there is a ribbon cutting for Mid-Valley Health Center by Fashion Place Mall. February 24th is a retirement party for Gary Healy from 2:00 to 3:00 in the Council Chambers.

Chairman Camp adjourned the meeting.

Kellie Challburg
Council Office Administrator II