Citizen Conservation Board (CCB)
Regular Board Meeting Minutes
April 8, 2021; 4:30 PM
Meeting held virtually via Zoom

Board Members Present (8 out of 14 members required for a quorum):
1) Diana Hammer, Chair
2) Mark Juedeman, Vice Chair
3) Valerie Stacey, Vice Chair
4) Ann Brodsky
5) Steven Costle
6) Elizabeth Grant
7) Patricia Heiser
8) Lucy Lantz
9) Carlin Onstad
10) Denise Roth Barber
11) Makenna Sellers
12) Richard Sloan
13) Brian Solan

Board Members Not Present:
1) Becca Boslough

City Staff Present:
Mark Fitzwater, Wastewater Superintendent
Ben Rigby, Drinking Water Superintendent
Patrick Judge, Sustainability Coordinator

Others Present:
Wendy Grosvenor, Johnson Controls
David Naccarto, Johnson Controls

Call to Order:
Chair Diana Hammer called the meeting to order at 4:30 pm and welcomed all participants.

Minutes:
Richard Sloan moved adoption of the March 11, 2021 minutes. Mark Juedeman seconded the motion, and the motion passed unanimously.

Guest Speaker – Mark Fitzwater:
Mark made the following "Wastewater Plant 101" points:
• The Wastewater Treatment plant is used for the treatment of city sewage. It also processes septic materials brought in by truck from valley residents.
• The overall goal is to clean the water to a level where it can be discharged safely to waterways – Prickly Pear Creek in the case of Helena.
• The two key measurements are:
  - Total Suspended Solids (TSS) - particulates
  - Biological Oxygen Demand (BOD) - a measure of organics, a form of pollution
the biosolids are land

- In addition, DEQ has new limits for nutrients (phosphorous and nitrogen), which can cause toxic algae blooms. Meeting these new limits could be expensive. Note that the current legislature may reverse those requirements.
- Starting in 2000, the plant began aggressively innovating reductions in energy use, motivated primarily by cost savings with the added benefit of making the plant more environmentally sustainable. Mindful that at some point a major (and costly) expansion will be needed, staff is always looking to be a careful steward of taxpayer money.
- They started with the low-hanging fruit of lighting upgrades. Originally, that meant converting to T-8 fluorescents, but recently it's LEDs.
- They've also replaced many pumps and motors with variable frequency drives (VFDs). Because they run continuously, at lower speeds, they are much more efficient than the off/on motors they replace. They also generally create smoother operations for the plant.
- The plant also tries to keep their lift stations at a high elevation, to minimize pumping costs.
- In 2009, they received a NorthWestern Energy (NWE) Universal System Benefits (USB) grant for a 3.5 kW, pole-mounted solar array that provides enough power to meet the needs of the administrative building. The panels are highly visible, and serve as a useful demonstration project. John Campbell was a great resource for these projects (NWE Demand Side Management rebates were provided for some of the efficiency projects).
- In 2006-07, the plant started capturing methane (CH₄) – a byproduct of the anaerobic digestion process – and using it in their boilers to provide both space heat and process heat. In the summer time, some of the gas is still flared, simply because the plant doesn't need to be heated at that time and they have no other use for it. This represents wasted energy, but at least flaring converts the gas to CO₂ (which is somewhat less harmful as a greenhouse gas).
- They also investigated "co-gen" opportunities to generate electricity as well as heat. Microturbines and piston engines were explored, but proved cost-prohibitive because of the gas-cleaning required. They settled on Stirling Engines, which are external combustion engines that don't require gas cleaning (Stirling Engines are an old technology, but this was a new application). At the time, there was only one company offering these engines and the City was able to acquire two of them essentially at-cost (in a beta-testing arrangement). For awhile, the engines produced ~100 kW of power, which was entirely consumed on-site (forgoing the need for a net-metering agreement). Unfortunately, the company got bought-out and the new company no longer supported this application (no longer provided replacement parts), so the City sold the units back to company.
- The plant has a huge air-demand for secondary-treatment. They installed positive displacement blowers that are more efficient than centrifugal blowers, because they can be powered by VFDs. However, with the new nitrogen and phosphorous regulations, the plant had to go back to the centrifugal blowers.
- The plant capacity is 5.4 million gallons per day (MGD), but typically only runs a little over 3 MGD. When Mark Fitzwater started at the plant in 1992, floodwater was a major problem. Since that time, the City has done a great job isolating the stormwater lines from the sewer lines, thereby postponing the need to expand the plant.
- In response to a question - yes, the staff has looked at using constructed wetlands to treat wastewater, but too much are would be required. To process that amount of waste, you would need essentially the whole valley.
- The plant uses activated sludge and does not have lagoons or ponds. Therefore, "floating solar" isn't an option.
- Biosolids are mixed with compost and used at the landfill for cover soil / vegetation. In the summer, the biosolids are land-applied by a local farmer. The biosolids are monitored by the EPA under the
Class B standard. To reach the Class A standard, the digesters would have to be heated significantly, which would be costly / energy-intensive.

- Yes, tours are re-starting, slowly. The CCB expressed interest in lining-up an in-person tour when available. Valerie Stacey noted that a video tour of the plant is available here: https://www.youtube.com/watch?v=q86v9MIP4

- In summary, the plant has implemented a number of innovative strategies, but unfortunately had to abandon a couple of the big ones (Stirling Engines and positive displacement blowers). Pat offered to prepare and share an analysis of the historic energy use at the plant.

**Guest Speaker – Ben Rigby:**

Ben made the following "Drinking Water Plant 101" points:

- Helena's water demand ranges from about 3 million gallons per day (MGD) to upwards of 15 MGD during the summer irrigating season. Despite growth in the city, water use has remained very flat. This is largely due to the elimination of some major leaks in the system (through pipeline replacements, reservoir linings, etc.).
- The Helena water supply system consist of three major sources:
  1. Ten Mile Treatment Plant (TMTP), located at the base of Rimini Rd, with a capacity of 7.9 MGD
  2. Missouri River Treatment Plant (MRTP), with a capacity of 12 MGD
  3. Eureka Well, with a capacity of 0.5 MGD
- The TMTP is a completely gravity-run operation, drawing from the Chessman Reservoir (6200'), the Scott Reservoir (7200'), and headgates on six different creeks in the Ten Mile basin. The elevation of the treatment plant is 80' above the highest reservoir in town (Nob Hill).
- Hence, "Mother Nature is on our side with Ten Mile." In addition to the avoided pumping costs, the water requires very little chemical treatment and is aesthetically very pleasing.
- The cost of water from TMTP is ~$140/MG versus ~$660/MG at MRTP. MRTP is dormant most of the year, but needed for the high-use summer months (and as a back-up in case of emergency). MRTP has enormous power demands, with 3 x 600 horsepower pumps (= 1.34 MW) needed to lift water to the reservoirs above LeGrande. (Significant elevation gain, and water is heavy!)
- The Eureka Well is an 80' deep former mine shaft located in the Claimstake Apartments (above the library) the provides delicious water with very little treatment (just 5 gallons of chlorine needed per day x $5 per gallon of chlorine + $1500 per month in pumping costs = cheap!). Staff has been working to increase use of this resource, which has the added benefit of decreased stormwater flow. Also, water from this well helps offset the more expensive MRTP water in the summer months. Both are located in the "Malben Reservoir Zone." Eureka water feeds the Hale Reservoir (2 million gallon capacity) and Upper Hale Reservoir (200,000 gallon capacity).
- In response to a question – the Helena drinking water system is not networked, which provides better protection from cyberattacks such as recently occurred in Tampa, FL.
- TMTP Projects (recent, current, and proposed):
  - upgraded chemical pumps, mixing chambers, etc.
  - 10 months ago, they installed a heater to optimize mixing in emulsion chamber
  - heating and cooling 100% "off the grid" (meaning no natural gas hookups) instead they rely on a **water-source heat pump**, located in the inside clearwell
  - upgrading all the pumps
  - aiming for longer filter runs, less wastewater, less energy
  - would like to use the waste byproducts in road mix, rather than trucking to Sparrow Pit due to historic mining & aluminum (alum), the waste is regulated (Class A)
  - spring is difficult, because water comes down so fast and doesn't have much contact time requiring more chemicals – they're looking at building settlement ponds uphill
- also looking at automated headgates, which would save drive time
- they are conducting filter rehab, and moving to air scours (rather than using finished water)

- MRTP was built in the 1950s, with several major upgrades since then. It's a zero-discharge facility, with all wastewater used to irrigate a 5-acre alfalfa hay field.
- Unlike TMTP, the City does not own the water rights for the Missouri River water. It has to purchase the water from the Helena Irrigation District under a contract that expires in 2045 (at which time it will become even more expensive).

- MRTP Projects (recent, current, and proposed):
  - upgraded computer system & chemical feed system
  - upgrading of the raw water valve/line
  - upgrading of the heating system – the dehumidifier blows out a lot of the warm air
    - it's currently very expensive to heat the plant, even just to keep it at 40°F!
    - have to heat it year-round, even when not using the plant, at a cost of ~$20,000/yr
  - recently fixed a calcified mixing chamber, which will save resources

- Long-term vision:
  - more fully utilize Helena's extensive groundwater rights
    - 3.2 billion gallons/yr from the deep aquifer (500'+)
    - there's a study underway to further explore this (Hydrosolutions or Hydrometrics)
  - power the pump stations with renewable energy
  - nitrates are increasingly becoming a problem in the valley – extend City services?
  - last time they looked at it, in-pipe hydro microturbines didn't pencil out
    - it would remove too much head (pressure), and then you'd have to pump it
    - but perhaps turbine technology has improved since then

**Water Conservation Committee:**
Valerie Stacey reported that the "Water Wise Workshops" will be launched in May. The Committee will be publicly announcing the workshops soon.

**Waste & Recycling Committee:**
Denise Roth Barber and Ann Brodsky reported the following:
- On Monday, April 5, the Committee and Resilient Helena hosted another installment of the ongoing "Community Conversation on Reducing Helena's Waste Footprint" featuring Leigh Ratterman, the Zero Waste Manager from Home ReSource in Missoula. The presentation went well, and there were approximately 17 attendees.
- The Committee is hoping to meet with Public Works Director Ryan Leland soon. They've requested a preliminary look at the FY 2022 Solid Waste Budget.

**Energy & Transportation Committee:**
Mark Juedeman reported the following:
- Big Sky Passenger Rail Authority (BSPRA) – The L&C County Commission postponed their final decision on whether to join the BSPRA until June 10. They have requested that the Authority provide additional financial protections and off-ramps.

**Outreach & Education Committee:**
Elizabeth Grant has joined the Committee, but the Committee did not meet since the last CCB update. Pat suggested that the Committee (and/or the full CCB) consider meeting with the new City Public Information Officer – Jacob "Jake" Garcin.

**Tree Planting Team:**
Carlin Onstad reported the following:
• The tree-planting project will take place in the Lyndale and Hannaford neighborhood, near HHS.
• Partners include CHS Green Club, HHS Green Group, City Arborist, Growing Friends, and local businesses like the Vanilla Bean and Stonetree Climbing Center.
• There is no set date for the event yet, but further details will be forthcoming soon.

Letter to the City Manager:
Diana thanked Ann and Richard for drafting the letter, and also described her revisions. Ann described the substance of the current letter as:
1) expressing appreciation for the Manager's support of sustainability (including her recent action on to preserve glass recycling and her proposed sustainability staff addition of +0.5 FTE), and
2) expressing the importance of protecting the Sustainability Coordinator's ability to work City-wide, even if that position is moved from the City Manager's Office to Public Works Admin. After some discussion, Denise Roth Barber moved that the revised letter be sent to the City Manager. Steven Costle seconded the motion, and the motion passed unanimously. (The final letter can be viewed in the Addendum below.)

Emerging Issues / Other Business / Announcements / Public Testimony:
• Diana thanked all of the committees for sending their draft 2-year workplans. She will compile everything, send it to the board, and post it as a "living document" that can be revised as tasks are accomplished and new priorities emerge.
• Diana will be working on the Earth Day Op-Ed discussed at the last CCB meeting. She thanked the group for the suggestions they have provided thus far, and invited them to continue to do so.
• Carlin Onstad announced that the CHS Green Club will be selling tomato- and pepper-plants as a fundraiser. He will send out the info via email.
• Diana invited anyone on the call, including the public, to share any other comments or questions they might have. Denise thanked everyone for a great meeting. She especially appreciated all of the detailed information from the guest speakers.

Next Meeting:
Diana announced that the next regular CCB meeting will take place Thursday, May 13 at 4:30 pm. Please contact her with any agenda items.

Adjourn:
With no further comment from the board, staff, or public, Diana adjourned the meeting at 6:11 pm.

Minutes prepared by Patrick Judge.

Addendum:
Rachel Harlow-Schalk
Helena City Manager
316 N. Park Ave.
Helena, MT 59601

Sent via E-mail

April 9, 2021

Dear Manager Harlow-Schalk,

Thank you for taking the initiative recently to direct the City’s Solid Waste Division to temporarily stockpile and not landfill glass brought to the Transfer Station for recycling. We understand that Ash Grove Cement should soon resume accepting Helena’s glass for recycling and use in its cement manufacturing process.

The CCB also wants to thank you for seeking another half-time sustainability position and to convey the CCB’s wholehearted support. We anticipate testifying to the City Commission in support and ask to be kept apprised about when the CCB can provide comment.

Lastly, the CCB understands you have decided to house the Sustainability Coordinator in the Public Works Department, rather than in its current location in the City Manager’s Office.

The CCB views sustainability work as a City-wide effort, involving all City Departments (to varying degrees) as well as the Helena community. To be most effective, the Sustainability Coordinator must be free to work with all appropriate City Departments and to operate and make recommendations to the City independently. For example, a significant amount of the Sustainability Coordinator’s work involves work to reduce the City’s energy consumption and greenhouse gas emissions. These efforts run across City operations, including Transportation, Facilities, and Parks and Recreation, not only the Public Works Department. While the organizational decision has been made, the CCB requests that you ensure that the Sustainability Coordinator be able to continue to work inter-departmentally and make recommendations independently, as these are critical functions of the position.

Thank you for considering the CCB’s views. We look forward to our continued work with you as we strive to create a stronger, more climate-resilient community.

Sincerely,

Diana Hammer
Chair, Citizen Conservation Board