Canyon Water Resources Meeting

Notes

January 23, 2019
2-4pm
Buck's T-4

Notes: Karen Filipovich, consultant for Gallatin River Task Force

Detailed Notes

Participants were invited to sign in so that they could be contacted in the future.

Welcome

David O'Connor, an owner of Buck's T-4, Chamber of Commerce Board member and stakeholder in the Big Sky Sustainable Water Solutions Forum process gave a welcome and brief introduction to why the canyon area is important for water resources.

The Big Sky Sustainable Water Solutions Forum brought together many different experts together from engineers to water experts and representatives of different areas of Big Sky and downstream. O'Connor represented a layperson perspective from the canyon in the process. The process worked to identify community solutions for water management. The canyon was identified as an important area priority for further water management. It is hoped that this meeting is the first in a process that allows canyon residents and business owners to work together further on identifying suitable community water management solutions. He stated the hope that today would bring out a good discussion and identify some areas of interest for further discussion.

Presentations on Water Resources in the Canyon Area

Several water experts presented on water resources in the canyon area.

Big Sky Water Stewardship Priorities: Kristin Gardner, Gallatin River Task Force.

Kristin Gardner is the executive director of the Gallatin River Task Force and her organization served as the host for the Water Forum. She gave a brief overview of the planning process. She is also a canyon resident.

The vision of the Big Sky Sustainable Water Solutions Forum is:

> ***Big Sky*** *strives to be a model mountain community by* ***protecting and improving water resources, sustaining ecological health of the watersheds,*** *and supporting a* ***vibrant local economy.***

Participants in the Water Forum chose this vision because ensuring sufficient clean water to both natural and human communities is necessary. Gardner outlined the goals in the three focus areas:

Ecological Health of River Systems

GOAL: *Maintain and enhance streams, riparian areas and wetlands. Water remains clean and cold.*

Recommended Priorities:

- Watershed Monitoring Program
- Watershed Dashboard
- Watershed Restoration and Conservation

Water Supply and Availability

GOAL: Manage and balance surface and groundwater supplies for human and natural communities.

Recommended Priorities

- Expand Monitoring and Modeling
- Develop Strategies for Water Conservation
- Stormwater Management
- Wastewater reuse
- Water Right Mitigation
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Wastewater Treatment and Reuse

GOAL: *Develop and implement wastewater management to meet community needs and protect and improve the ecological health of the river systems.*

Recommended Priorities

- Treat wastewater to high standards
- Expand recycled water for irrigation
- Snowmaking with recycled water
- Groundwater recharge with recycled water
- Address septic and small community systems

All goals and priorities were identified through consensus in the Water Forum process.

Plan Implementation:

The vision for the plan is to implement priorities of a community partnership currently termed the "Headwaters Alliance." Six committees were envisioned including one focused on priorities within the geographic area of the Canyon.

Health of the Gallatin River: Kristin Gardner, Gallatin River Task Force

Gardner then gave an overview of her area of expertise on water quality.

Currently, the West Fork, South Fork, Middle Fork, Taylor Fork, and Cache Creek all have water quality factors that do not meet state water quality standards. The main stem of the Gallatin has no red flags in

its water chemistry. However, some aquatic insect data indicates impacts from erosion and degraded streamside vegetation. In 2018, there was also a large algae bloom. The cause of the bloom is still being investigated since algal blooms can be driven by nutrients, temperatures, sunlight, weather, ice and the water year precipitation amount and patterns.

There are several projects to address concerns on the mainstem. Restoration projects include the Moose Flat project completed in 2018 and future river access projects at Deer Creek, Baetis Alley and Porcupine. Intensive algae monitoring continues and there is project planning for an extensive groundwater and nutrient loading study in canyon.

Water supply, ground water and source water considerations: Tammy Swinney for Christine Miller, Gallatin Local Water Quality District

The Big Sky and Canyon area are in the headwaters of the Gallatin Watershed in a complex geologic setting. Wells are in proximity to the river and part of the Canyon area is also within the Yellowstone Controlled Groundwater Area.

Drinking water is supplied from groundwater. There are two types of wells: private, domestic wells and municipal and public water supplies (PWS). Wells are either shallow or deep and both exist in the Canyon. Shallow wells are in close proximity to the river, are susceptible to drought and contamination. Deep wells could have low productivity, "challenging" water chemistry, and expensive drilling.

Public water systems are required to provide water quality data. Drinking Water Watch through DEQ keeps track of the data. Nitrate is a nutrient that has both natural and human sources. If nitrates get too high in a system, it can negatively affect human health or aquatic life, if present in surface water. Drinking water standards are 10 mg/L. Nitrate levels are still quite low in groundwater in the Canyon but have been increasing over time and are rising as one moves from south to north in the Canyon.

In domestic wells, there are data available from 12 wells in the Canyon area. Nitrate vary from .02-2.58 mg/L. These samples are snapshots in time of the water quality. Well owners are all encouraged to test annually for nitrate and bacteria. Because arsenic is present in the natural geology, screening for arsenic is also recommended.

Nitrates come from naturally-occurring, wastewater, fertilizer, and animal waste are all potential sources of nitrates. Background nitrates in the area are less than 2 mg/L. EPA has set the Maximum Contaminant Level at 10 mg/L. AT 5 mg/L, PWS are required to sample quarterly which increases cost and effort for those public water supplies.

The Gallatin Local Water Quality District (GLWQD) holds well awareness to help well owners operate their wells well. There are two levels of courses offered: introductory and advances levels. Contact the GLWQD if interested.

There is also going to be an Upper Gallatin River Corridor study starting in 2019. It will assess the cumulative effects of existing and future development on water quality and quantity. This information will help characterize and manage water resources in an important canyon aquifer.

For more information:

Gallatin Local Water Quality District: https://glwqd.org/

Water Rights: Kerri Strassheim, Department of Natural Resources and Conservation

The Big Sky area lies within closed basins. This means that surface water is considered fully appropriated and new surface water rights are not issued. The Gallatin watershed is in the Upper Missouri River Basin Closure and the Madison watershed is in the Jefferson and Madison Basin Closure. Groundwater that is considered connected to surface water is also included in these closures. The Yellowstone Controlled Groundwater Area covers part of the Canyon area. There is also the Forest Service Compact for the forest lands in the area.

In the big picture, senior rights holders downstream include hydropower and agricultural rights holders in both watersheds. These senior rights holders have first right to water if there is not enough to go around. In these watersheds, post-1890 priority rights are considered priority flood rights. Additionally, Fish, Wildlife and Parks has instream flow rights that are not always met. There are relatively few mitigation opportunities in the Big Sky area. If mitigation were an option, "new" uses of water might be possible. A law change in 2014 now means that Combined Appropriation of groundwater developments are now more limited to properties subdivided before October 2014.

For the future, understanding groundwater complexity and connection to surface water could be helpful. Green infrastructure and other mitigation tools that change timing of water (or slow it down) could be a useful supply too. These include wetland restoration and injection wells. Conservation is a way to stretch water rights and wastewater treatment methods have potential for opening up more beneficial reuse.

Further Resources:

- http://dnrc.mt.gov/divisions/water DNRC Water Resources Division Homepage – links to many resources from here
- http://wr.msl.mt.gov/default.aspx DNRC Water Right Query System – create an index or look at the water right scanned document (scanned file is where can get a more accurate file map)
- http://geoinfo.msl.mt.gov/geography/water_information_system.aspx MT State Library Water Information System – map data can be downloaded from here

Wastewater Treatment Systems Big Sky and Canyon: Lori Christenson, Gallatin Health Department

Wastewater treatment is important because it treats waste. This has been a huge factor in improving human health. Christenson asked participants how many were on individual septic tanks. About half had individual septic systems. Ashley Kroon, DEQ, is also participating today in the Q and A period to answer any questions about small community systems.

Septic systems direct effluent to a septic tank then to drain field. The then treated effluent evaporates and percolates to the water table. Wells pump from water in the water table. If septic systems are improperly maintained or positioned, wells can be contaminated.

There are several categories of systems. Municipal systems operate under the control of a municipality with a growth policy. Public systems are defined as a system that serves 25 or more people for 60 or more days per year. This category also encompasses systems with 15 or more connections, regardless of population served. System systems are individual systems. Responsibility for maintenance and testing varies by systems.

In an individual system, the owner is the operator and responsible for all monitoring and testing. In public and wastewater system, regular maintenance and testing is the responsibility of the operator, not those connected to it.

In the Big Sky area, there have been roughly 1,000 septic systems installed. Based on calculations is based on an average family use of 300 gallons/day, 300,000 gallons of wastewater is generated per day in the canyon. If these septic tanks are all pumped on the recommended 5-year interval, it is about 1,000,00 gallons of total wastewater and 200,000 gallons of pumped septage per year.

At last count, there are 31 commercial systems from before the turn-off to Big Sky and south to Cinnamon Lodge. Most are public systems and about 30% provide Level 2 treatment (a higher treatment level). Level 2 systems are nitrogen-reduction systems are assumed to cut nitrogen discharge in half compared to Level 1 system (24 mg/L vs. 50 mg/L). [Nitrates are a molecule that contains nitrogen] Level 2 systems are generally monitored once they are installed and have actual use data that can be obtained from system vendor. If a state discharge permit is involved, the flow is monitored and reported monthly, quarterly or yearly to DEQ, depending on the permit requirements. These systems are mapped in the Environmental Health system and information about permitted systems are available online.

Further Resources:

Gallatin Interactive GIS Map: searchable GIS Map that can be accessed by any member of the public. This searchable map and include a disclaimer that the wastewater treatment system layer is part of ongoing work and in progress. This layer **may not contain all current data because not all permit records have been scanned and added to the map**. If you discover a lot that doesn't indicate a permit exists (i.e. has a green dot) additional information about wastewater permits may be available and obtained from www.healthygallatin.org or by calling the Gallatin City-County Health Department's Environmental Health Division at 406-582-3120.

Opportunities for Wastewater Treatment and Community Decision-making: Bob Zimmer, Greater Yellowstone Coalition

The Greater Yellowstone Ecosystem is a stakeholder in the Big Sky area because of its interest in water quality and the environment. It was one of the stakeholders in the Water Forum, GYC has a strong interest in helping the residents of the canyon to make determinations about how best to manage local water resources for people and nature. GYC is hear to help facilitate organization and discussion.

Addressing infrastructure challenges can help prevent long-term issues. For example, in the Teton Village-Wilson area near Grand Teton National Park did not have any kind of centralized system. Over a period of years, septic tanks were installed to an inappropriate density, with leachfields stacked in some cases. This affected the water quality in the Snake River and has taken significant investment to address

the infrastructure failures. For Big Sky and the canyon, the opportunity is to find a way to provide adequate infrastructure for growth while simultaneously ensuring that water quality remains high.

Greater Yellowstone Coalition is available to help with organizing and facilitation for the Canyon.

Big Sky Zoning Update: Mathieu Menard, Mayana Rice, Gallatin Planning Department

The Big Sky Zoning District was adopted July, 1996. This zoning applies to all properties in the Gallatin County portion of the Big Sky Resort Tax District. It generally sets the development pattern of Big Sky. Several types of zoning exist. R-SF-11,000 is single family residential with a minimum 11,000 square foot lots at about 4 dwelling units/acre. RC-SF-1 and RC-SF-10 single family residential has no minimum lot size with density based on gross acreage. Clustering is encouraged. TCR applies to Town Center allows multi and single-family residential. There is no maximum density, limited by square foot entitlements. R-MF-3,500 is multi-family residential at 12 units per acre. This is the highest density residential zoning in Big Sky outside of Town Center. MC (Meadow Center) is commercial zoning has no minimum lot size and allows for multi-family housing as a conditional use. TCC is Town Center Commercial allows multi-family housing on the 2nd story and above. C-I commercial and light industrial also allows for more intensive uses and multi-family housing as a conditional use.

The Canyon area has 1,660/4,254 private land acres undeveloped. There are 805 potential dwelling units on undeveloped parcels under current zoning, ignoring existing physical and environmental constraints.

Current code addresses water by reviewing water and wastewater prior to project construction, setbacks to rivers, streams, watercourse conveyance subdivision review standards, conditional use process for certain types of uses that might have a higher underlying impact to the community, variance process for any requests that detour from the underlying regulations, enforcement department and stormwater from large-scale parking lots.

The zoning update is an opportunity to offer ideas for areas that need updating. So far, suggested topics to explore include affordable housing, density, short-term rentals, Gallatin road and river corridor regulations, septic issues and water use, landscaping, accessory dwelling units and tiny homes, planned unit developments, and conditional uses. In 2018, the 90 land use permits were granted. The largest category were the 51 single family residences. In Gallatin County, most zoning permit decisions between 2005-2018 were approved. The update is an opportunity to improve the “user friendliness” of the regulations. The tentative timeline for update is outreach and information gathering in winter-early summer 2019. Phase 2 is drafting updated language in summer of 2019. Phase 3, the final draft presentation to the Advisory Committee and the Planning and Zoning Commission in the Fall of 2019. Phase 4 is a Planning and Zoning Commission Hearing to Initiate Zoning. The final phase is the County Commission Hearing.

Further Resources:

For questions and comments on topics for the Big Sky Zoning update, contact Mathieu Menard, Planner, Gallatin County Planning Department: Mathieu.Menard@gallatin.mt.gov

Ideas and Options for Addressing Water Challenges: Karen Filipovich

Karen Filipovich presented several options for further discussion. These options were generated through the Big Sky Sustainable Water Solutions Forum, models from other communities and Big Sky resident suggestions.

Water Supply Options:

Individual Actions:

- Regular well maintenance and testing
- Water conservation – indoors and out

Partner Actions:

- Big Sky Conservation Program – Rebate Promotion
- Water metering on individual and community wells
- HOA policy changes
- Zoning changes related to landscaping for conservation
- Slowing the flow – natural storage and stormwater projects

Wastewater Treatment and Reuse Options:

Individual Actions:

- Individual septic and community system maintenance
- Individual septic and community system upgrades
- Indoor water conservation

Partner Actions:

- Group maintenance agreements with pumpers
- Establish septic maintenance district
- Regional treatment upgrades
- Ordinances on centralized piping in anticipation of centralized treatment
- Centralized treatment –regional to full Canyon

Ecological Health and Cross-cutting Options:

Individual Actions:

- Landscape management
- Riparian and wetland conservation and restoration
- Stormwater management – building phase and infrastructure
- Road sanding and salting management

Partner Actions:

- Public land and multiple landowner conservation/restoration projects
- Zoning changes for landscaping
- HOA policy changes on landscaping
- Stormwater mapping and infrastructure planning
- Road sanding and salting management

Questions and Discussion

This section is a summary of the questions, comments, and areas for further investigation. No answers should be construed as final answers

Q: How is water considered in the building permit process?

A: The proper water resources need to be secured and shown. There are two acts, one for a parcel over 160 areas and one that affects those under 20 hours.

Q: If we're in a closed basin, how more development proceed?

A: Currently, there are water rights that are not fully used yet. For example, Ramshorn has some a right that isn't fully used yet. If a lot was platted prior to October 2014, an exempt well could be drilled if the development meets the requirements for the exempt well. The maximum of 10 acre/feet annually is quite a bit of water. However, it is true that options for water supply going forward are tighter than they used to be.

Q: What is limiting development in the Canyon area? Is it the wastewater treatment or zoning? In the Lower Basin aquifer, we are seeing an increasing trend in nitrates in groundwater (GLWQD PWS data). Since development has been following Gallatin County's Zoning template, does this zoning need to be adjusted to mitigate this upward trend in nitrates? (we have no data from Karst showing increasing nitrates)

A: Zoning does limit the number of units that can be built and limits current density. There are also limits for density for septic system and various other treatment options. For instance, Ramshorn has a community wastewater system that allows for higher density. Degradation is also a factor and if a system discharges over 5,000 gallons/day, then more permit conditions related to water quality degradation occur.

Q: What would a centralized system do for addressing growth? Would we have to overbuild such a system?

A: A centralized system does need to be built to address the density, but because treatment systems have life-spans, a centralized treatment plant does not need to be built to address all future potential growth. Like the Big Sky Water and Sewer District and other public utilities, plant capacity can be increased over time.

Q: What are factors to think about with irrigation as a disposal method?

A: Treated reuse irrigation is 100% consumptive. All water needs to be taken up and can't be used for mitigation (many forms of wastewater reuse are not fully consumptive). Similarly, nutrients need to be absorbed by the plants and soil. There are limits to how much reused water can be taken up by a site.

Comment: As we talk through the options, it is important to remember that the 20 acre parcels up from the turn have different legal designation and many not end up on centralized treatment.

Additional comment: Factors such as side of the river, density, and distance may affect which wastewater treatment options are feasible.

Q: Would a centralized treatment plant require tying into a sewer trunk with a lift station to the existing plant?

A: No.

Q: What is the estimated cost of the pipe down the canyon and centralization?

A: A study was conducted in 2008 that looked at several factors related to a full-build out scenario of 1 million gallons/day of effluent. In 2008 dollars, the cost of a collector and trunk was about $20 million/day. The study is available here.

Q: Is it possible to think about another site for a treatment plant?

A: Yes. The gravel pits area is one possibility.

Q: Is it necessary to go directly to centralized treatment?

A: No, not at all. Gallatin Gateway did not own anything for a decade after it became a district. There are several steps in forming a district. Agreeing to form a district can be the first step. In Gateway, people agreed to a mandatory hook-up only when the bonding vote took place to own its own equipment.

Q: What triggered Gallatin Gateway's decision to think about a district?

A: High nitrates were found in the school system. There was a strong need to deal with it because more septic systems could not be installed because of the drinking water problems.

Q: How does the system in Gateway now work with the 4-corners system?

A: There is an inter-local agreement. Gateway bought 27,000 gallons a day. This allows space for further development. Current use is approximately 15,000 gallons/day.

Q: What did it cost for Gateway to go for centralized treatment?

A: Gallatin Gateway is fairly unique because it has a large number of low-income residents; 65 of households make less than $30,000/year. 65-75% of the project was funded through grants and then has a $1.6 million loan. The overall project was multiple millions. The current bill is about $69/month, based on a two-bedroom home. Larger homes are charged more.

Q: If the Canyon went to centralized treatment, what would happen to the existing infrastructure in the ground?

A: Probably it would be left in the ground and collapsed. This would be part of a plan.

Q: What about treatment levels? Over time, nitrates have been rising in the canyon. What will happen in another 30 years if we don't look at reducing nutrient loads?

A: Overall, new treatment systems have higher treatment levels. With older systems, maintenance is key. If nitrate levels get too high (above 5 mg/L), potential further steps would need to be taken.

Comment: The Lower Basin project starting this year will assess cumulative impacts in an important aquifer. This study will help us figure out nutrient loads and can help the community figure out density

implications for development. One thing that study will need are wells. If you are willing to have a test well or allow your domestic well for monitoring, it will be really helpful.

Discussion:

- Who can connect?
- Who might be interested in thinking about a district?
- Some further cost figures would be helpful
- What decisions need to be made?
- A survey could be helpful to identify interest in exploring options
- Would be helpful to have more details on Gallatin Gateway/4-corners and perhaps Clancy's district formation and delivery
- Would like a best guess of critical paths and decisions that need to be taken to solve both nutrient concerns and development. Factors to consider might include:
    - Costs at various decision points
    - District framework; points of decision-making
    - Grant opportunities
    - When do decisions need to happen and who makes them?

Actions:

Gallatin River Task Force will initially host further action through its work hosting the Headwaters Alliance partnership that has come out of the Big Sky Sustainable Water Solutions Forum.

A next meeting in March will be scheduled for further discussion based on the questions and discussion from this meeting. Karen Filipovich will work with local water experts to find further answers for that meeting.