



BARR MILTON
Watershed Association

**Barr Lake/Milton Reservoir Watershed Association
Tech Committee Meeting
March 23rd, 2023, 9:00 – 11:30 am
Virtual Only**

Tech Committee Meeting Minutes

Attendance

Erin Sandos – South Platte Renew (SPR)
Brad Cox – City/County of Denver
Steve Lundt – Metro Wastewater Recovery
Kelly DiNatale – United Water & San.
Chris Newton - ECCV
Curt Bauers – FRICO
Nicole Laurita – SPR
Alan Polonsky – City/County of Denver
James Dorsch – Metro Wastewater Recovery

Dylan Ross – City/County of Denver
John Stednick - FRICO

Guests:

Samantha Miller – BMW Coordinator
Craig Wolf – GEI
Nathan Jahns – GEI
Ken Wagner - Consultant

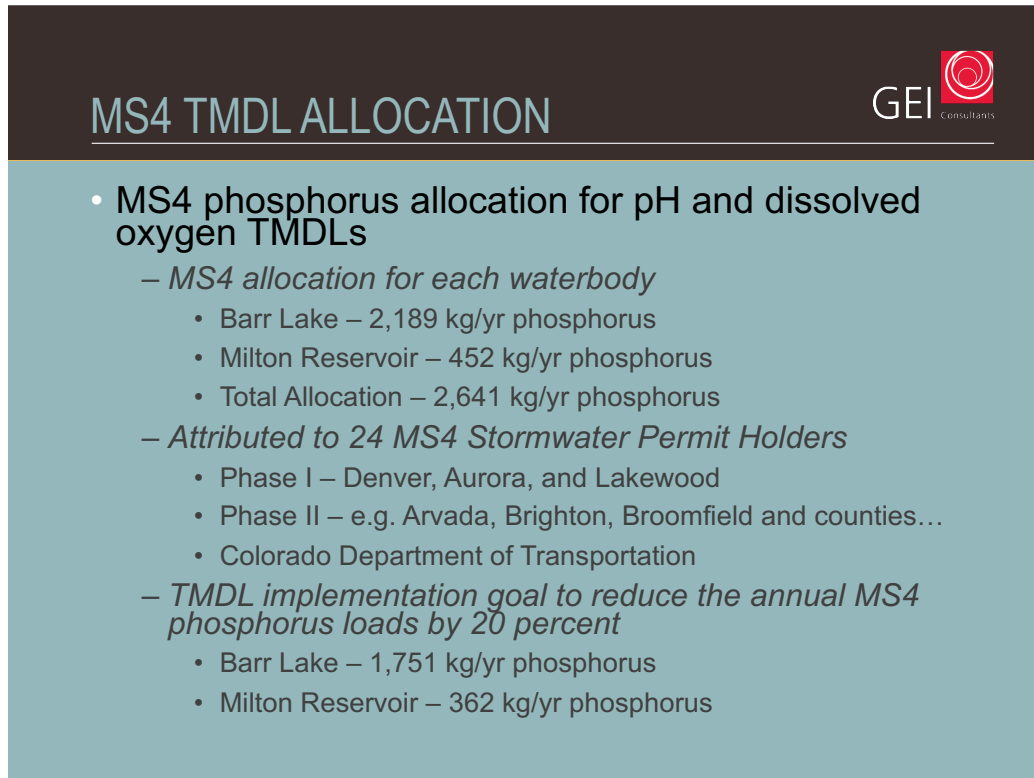
Approval of January Meeting Minutes – The January minutes were approved unanimously.

MS4 Baseline Loading – City and County of Denver has consulted GEI to quantify their contribution to the TMDL MS4 Wasteload Allocation. We will review the progress to date and help answer any questions to guide the analysis due April 1st, 2023.

“Quantification of Denver’s baseline contribution of phosphorus loading. The permittee must calculate an estimated baseline load contribution of phosphorus from Denver MS4 to the Barr Lake and Milton Watershed. The permittee must consult with the Barr Lake and Milton Watershed Association (BLMWA) on methods used to determine baseline loading in order to determine they are consistent with the Barr Lake Milton Reservoir TMDL and the most recent Implementation Plan.”

- A. The overall TMDL implementation goal reduction is 20%.
- B. Several existing/previous documents were reviewed in the analysis, including the SWAT watershed model and the City/County of Denver ArcGIS shapefiles.
 - a. They ran into trouble getting ahold of a functioning SWAT model.
- C. There were 19 subbasins in the watershed, with other outlier basins likely crossing over due to plumbing; 14 subbasins primarily influence Barr Lake, along with 126 HRUs (hydrological units). The HRU shapefile wasn’t available for the analysis, unfortunately.
- D. GEI recognizes that this modeling effort guided the TMDL, but didn’t provide exact numbers. Much was based on the consultant’s “Best Professional Judgement”. Additionally, these numbers are older and much has changed since then. For this analysis and reduction goal, these numbers must be used to provide a baseline to work from.
- E. Ken Wagner noted that the details of the numbers and exact specificity and accuracy don’t need to be of huge concern because there is so much variability.
 - a. It was further noted that the health of the lakes isn’t impacted by the specific numbers but it’s recognized that these numbers have to be identified somehow for their reduction and permit requirements.

- b. Ken continued to reiterate that Craig's approach seems sound because there has to be a number for them to work from, but the specific numbers are just not important. This is relative to the overall magnitude of total loading and the contribution of wastewater discharges.
- F. See below for (some of) GEI's slides that outline their approach to finding the numbers and considerations regarding the historical data/models used.



The slide features a dark blue header with the title 'MS4 TMDL ALLOCATION' in white text on the left and the 'GEI Consultants' logo on the right. The logo consists of the letters 'GEI' in a large, white, sans-serif font, followed by a red square icon containing a white circular graphic, and the word 'Consultants' in a smaller white font below it. The main content area has a light blue background and contains a bulleted list of information regarding MS4 phosphorus allocation.

MS4 TMDL ALLOCATION

GEI
Consultants

- MS4 phosphorus allocation for pH and dissolved oxygen TMDLs
 - MS4 allocation for each waterbody
 - Barr Lake – 2,189 kg/yr phosphorus
 - Milton Reservoir – 452 kg/yr phosphorus
 - Total Allocation – 2,641 kg/yr phosphorus
 - Attributed to 24 MS4 Stormwater Permit Holders
 - Phase I – Denver, Aurora, and Lakewood
 - Phase II – e.g. Arvada, Brighton, Broomfield and counties...
 - Colorado Department of Transportation
 - TMDL implementation goal to reduce the annual MS4 phosphorus loads by 20 percent
 - Barr Lake – 1,751 kg/yr phosphorus
 - Milton Reservoir – 362 kg/yr phosphorus

KEY DOCUMENTS REVIEWED

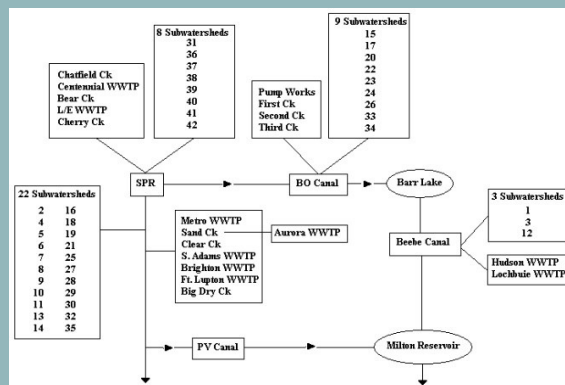
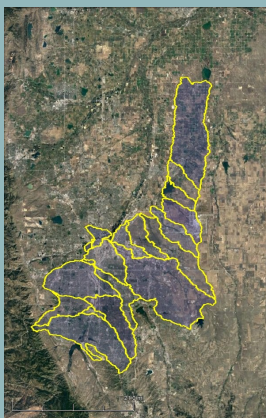


- **AECOM**
 - *SWAT watershed model files*
 - ArcGIS input shapefiles
 - Processing Excel files
 - 2010317 BMWSources edited 031710.xls
 - Calib_Watershed.xls
 - SWATOutput.mdb
 - Exported HRU, SUB, tblHruDef, tblSubDef to Excel files
 - HRULandUseSoilsReport.txt
- **City and County of Denver**
 - *ArcGIS shapefiles*
 - Denver County Boundary
 - MS4 Basins

INTERSECTION OF TMDL BOUNDARY AND MS4 BOUNDARIES



- **Identified 19 subbasins in the SWAT model where Denver’s MS4 basin boundaries intersect**
 - *14 subbasins primarily influence Barr Lake*
 - 126 Hydrological Units (HRUs)
 - *5 subbasins primarily influence Milton Reservoir*
 - 36 Hydrological Units



TOTAL PHOSPHORUS EXPORT BY SUBBASINS BASED ON TMDL



- Calculated the TP exported by each Subbasin using modeled percentages and TMDL MS4 total allocation (2,641 kg/yr)
- $0.35\% \times 2,641 \text{ kg/yr} = 9.22 \text{ kg/yr}$


Reservoir	Subbasin	TP (% of Total)	TP Export by Subbasin based on TMDL (kg/yr)
Milton	3	0.35%	9.22
Milton	12	0.00%	0.00
Barr	15	0.00%	0.00
Barr	23	0.59%	15.59
Barr	24	0.14%	3.69
Barr	26	0.00%	0.00
Milton	28	3.23%	85.31
Barr	31	10.61%	280.18
Milton	32	0.43%	11.33
Barr	33	0.00%	0.00
Barr	34	4.72%	124.72
Milton	35	13.85%	365.90
Barr	36	0.62%	16.34
Barr	37	14.08%	371.90
Barr	38	7.17%	189.30
Barr	39	8.86%	233.87
Barr	40	3.91%	103.29
Barr	41	1.33%	35.23
Barr	42	17.59%	464.59

APPROACH TO ESTIMATE DENVER'S MS4 CONTRIBUTION




Reservoir	Subbasin	MS4 % Coverage	TP Export by Subbasin based on TMDL (kg/yr)	Denver's MS4 Contribution (kg/yr)	Is the LU Applicable to Denver
Milton	3	<0.1%	9.22	<0.01	No, 100% due to Corn
Milton	12	0.6%	0.00	0.00	Yes
Barr	15	26.6%	0.00	0.00	Yes
Barr	23	30.4%	15.59	4.73	No, 97.79% due to BERM
Barr	24	138.9%	3.69	5.12	Yes, 100% due to BERM
Barr	26	47.4%	0.00	0.00	Yes
Milton	28	0.1%	85.31	0.12	Yes, 100% due to BERM
Barr	31	97.9%	280.18	274.28	Yes, 100% due to BERM
Milton	32	143.3%	11.33	16.23	Yes, 100% due to BERM
Barr	33	23.2%	0.00	0.00	Yes
Barr	34	38.1%	124.72	47.54	Yes, 100% due to BERM
Milton	35	16.0%	365.90	58.70	No, 97.17% due to BERM
Barr	36	100.0%	16.34	16.34	Yes, 100% due to BERM
Barr	37	50.2%	371.90	186.79	Yes, 100% due to BERM
Barr	38	106.6%	189.30	201.85	Yes, 100% due to BERM
Barr	39	27.1%	233.87	63.42	Yes, 100% due to BERM
Barr	40	50.0%	103.29	51.69	No, 98.49% due to BERM
Barr	41	36.0%	35.23	12.68	Yes, 100% due to BERM
Barr	42	10.8%	464.59	50.38	Yes, 100% due to BERM

DENVER'S MS4 CONTRIBUTION BY SUBBASIN



Reservoir	Subbasin	Denver's MS4 Contribution (kg/yr)	Is the LU Applicable to Denver	Denver's MS4 Contribution Adj by LU (kg/yr)
Milton	3	<0.01	No, 100% due to Corn	0.00
Milton	12	0.00	Yes	0.00
Barr	15	0.00	Yes	0.00
Barr	23	4.73	No, 97.79% due to BERM	4.63
Barr	24	5.12	Yes, 100% due to BERM	5.12
Barr	26	0.00	Yes	0.00
Milton	28	0.12	Yes, 100% due to BERM	0.12
Barr	31	274.28	Yes, 100% due to BERM	274.28
Milton	32	16.23	Yes, 100% due to BERM	16.23
Barr	33	0.00	Yes	0.00
Barr	34	47.54	Yes, 100% due to BERM	47.54
Milton	35	58.70	No, 97.17% due to BERM	57.05
Barr	36	16.34	Yes, 100% due to BERM	16.34
Barr	37	186.79	Yes, 100% due to BERM	186.79
Barr	38	201.85	Yes, 100% due to BERM	201.85
Barr	39	63.42	Yes, 100% due to BERM	63.42
Barr	40	51.69	No, 98.49% due to BERM	50.91
Barr	41	12.68	Yes, 100% due to BERM	12.68
Barr	42	50.38	Yes, 100% due to BERM	50.38
TOTALS		989.89		987.34

DENVER'S MS4 PHOSPHORUS CONTRIBUTION TO BARR LAKE AND MILTON RESERVOIR TMDLs



- TMDL MS4 phosphorus load to both waterbodies is 2,641 kg/yr
 - BPJ considering multiple lines of evidence
 - Barr Lake – 2,189 kg/yr (83% of Total)
 - Milton Reservoir – 452 kg/yr (17% of Total)
- Denver's total contribution to the TMDL MS4 phosphorus load to both waterbodies is 987 kg/yr
 - Barr Lake – 987 kg/yr x 83% = 818 kg/yr
 - Milton Reservoir – 987 kg/yr x 17% = 169 kg/yr

- G. Task 2 for GEI will show the actual MS4 load and where it occurs. They will explore what the baseflow component is, what's the load flowing down the stream all the time, and what the load during a storm event is.
- H. This approach should be able to be repeated for other Phase I entities like Lakewood and Aurora.
- I. BMW asked whether any monitoring we are doing could help? Moving forward, can it help show reductions? The answer was yes, this could be a key databased component on Task 2 for GEI and could help identify the baseline component flowing down the South Platte River.
- J. It was asked if GEI will be working as the consultant with the other Phase I holders? Brad said they will try to sell it with GEI so they don't have to reinvent the wheel.
- K. Brad asked for the "nod" from BMW to make sure their approach looks good so they can move forward. The Tech Committee approves of this approach and will recommend the entire Board approves of their approach.
- L. For GEI to get full board approval from BMW, they'd like to attend and present at the April board meeting. Erin will state that Tech Committee recommends approval of this approach.
- M. GEI will send a tech memo summarizing this process.

Actions:

- a. **Erin/Sami** will reach out about getting them on the agenda for April meeting.
- b. **GEI/Carig Wolf** will send a tech memo summarizing their process when it's completed.

Watershed Plan Update – It was decided that a subcommittee will be formed to continue working on the plan update. Having more than two people will be very helpful going forward.

- A. A subcommittee will be formed to work on this.

Action:

- **All TC MEMBERS** - Send Erin a note if you're interested in joining or have thoughts for this committee.

2023 Monitoring Plan - Steve updated the committee on monitoring for 2023.

- A. Steve and Curt both go out twice a month for monitoring and coordinate going around the same time to sample.
- B. Last spring/summer Steve started sampling First, Second and Third Creeks and the Beebe Pipeline. They are usually pretty dry and don't flow during the summer, but during the fall/winter they've all been flowing so they'll continue to be monitored.
- C. Autosampler update: construction at the National Western Center caused a temporary move of the equipment to the Burlington ditch, but it's worked out well so far. Relocation of the autosampler to its original site is delayed due to a pedestal tower, but we're hoping to have it relocated and recalibrated around May or early summer. It's still running, and GEI has been doing great with stormwater monitoring – we have the 2022 report from them (ask Steve).
- D. Curt updated that additional sampling of outlets from Milton and Barr and inlets to those lakes are taking place as well. FYI – they've dropped salinity samples.
- E. A reminder was made to check in with Denver Water on their new lab at the western center campus to see if we can tap into the data collected there.

Goals Discussion Review – Back in November, we identified priorities for the TC, including data management, monitoring (alkalinity and temporal pH), modeling, etc. Are there other questions/implementation efforts members would like to address?

- A. The group revisited this convo in order to focus and home in on our future goals as a committee.

- a. Steve mentioned still wanting to focus on in canal treatment, alkalinity, and possibly modeling (ours is outdated).
- b. It was noted that data visualization (like the current board-wide discussions going on the past few months) could help with future analysis as well.

Next Meeting

Tech. Committee: Thursday, May 25th, 9:00 – 11:00 AM

- Review available data for visualization tool.
- Review methods for compiling flow data (e.g. Beebe Canal).