



November 29, 2021

Broadwater County
c/o: Nicole Brown, Community Development Director
515 Broadway
Townsend, MT 59644
Ph: (406) 266-9211
e-mail: planning@co.broadwater.mt.us

**RE: Horse Creek Hills Subdivision – Water Usage Summary
Located in a Portion of the N ½, N ½ of SW ¼, & NE ¼, SW ¼, Sec. 31, T9N, R2E, P.M.M.,
Broadwater County, Montana**

Dear Ms. Brown:

This letter is provided as our proposed “Water Usage Summary” for Horse Creek Hills Subdivision, for 71 Ranch, LP. The overall proposed subdivision is generally bound to the east by Lower Confederate Road, and to the south, west, and north by Bureau of Reclamation and/or State of Montana property. The legal description of the approximate 442-acre property is the North One-Half, the North One-Half of the Southwest One-Quarter, and the Northeast One-Quarter of the Southwest One-Quarter of Section 31, Township 9 North, Range 2 East, Principal Meridian Montana, Broadwater County, Montana.

Allied reached out to the Montana Department of Natural Resources and Conservation (DNRC) in 2019, regarding this project, and confirmation on how to proceed based our proposed project. The project is proposing four (4) phases. As we understand, the subject property has up to 14 allocations for 10 acre-ft, based on the 1,320 ft spacing on 442 acres, thus, by right, can use up to 140 acre-ft of water. The Horse Creek Hills may utilize up to 50 acre-ft, with a remainder of 90 acre-ft of water.

DNRC has provide their letters of concurrence for water usage, as provided in the preliminary plat application. They typically summarize total usage. However, as requested, following is a summary regarding the basis of the water use calculations, including maximum irrigated areas.

As recently discussed, other counties are requesting that each lot install a water meter within the plumbing of individual water supply wells (typically in the utility room), and each lot shall keep track of total annual usage (via totalizer) and report to the underling Subdivision HOA. The Subdivision HOA would tabulate the usage, which can be made available if requested by DNRC. Note, the allowed irrigated area per lot, for each corresponding phase. We are amendable to putting the corresponding maximum irrigated areas in the final covenants, as a guideline for future lot owners.

See summary next pages

Horse Creek Hills Subdivision 1, consisting of twelve (12) lots on approximately 117.98 acres. This includes Lots 1-12, including one (1) commercial lot, (not to exceed 24 employees), and eleven (11) residential lots. We would anticipate the domestic water usage for the sum of the residential lots to be the following:

Domestic Use for Residential:

$$\begin{aligned} &= 250 \text{ gal/day/home} \times 1 \text{ home/lot} \times 11 \text{ lots} \times 365 \text{ days/year} &&= 1,003,750 \text{ gal/year} \\ &= 1,003,750 \text{ gal/year} \div (7.48 \text{ gal/ft}^3 \times 43,560 \text{ ft}^2/\text{acre}) &&= \mathbf{3.08 \text{ AF}} \end{aligned}$$

Domestic Use for Commercial:

$$\begin{aligned} &= 24 \text{ employees} \times 13 \text{ gal/day} \times 1 \text{ lot} \times 365 \text{ days/year} &&= 113,880 \text{ gal/year} \\ &= 113,880 \text{ gal/year} \div (7.48 \text{ gal/ft}^3 \times 43,560 \text{ ft}^2/\text{acre}) &&= \mathbf{0.350 \text{ AF}} \end{aligned}$$

Total Domestic Use for Project #1 is **3.43 AF**

The remaining appropriations for irrigation use would be **6.57 AF** (10.0 AF – 3.43 AF = 6.57 AF). If each of the lots were assumed to consist of the same amount of irrigated landscaped area, the area of lawn for each lot would be as follows:

$$\begin{aligned} \text{Irrigation Use} &= 6.57 \text{ AF} = (1 \text{ inch/week} \div 12 \text{ inches/ft}) \times 30 \text{ weeks/year} \times X \text{ acres/lot} \times 12 \text{ lots} \\ &= 30 \text{ ft} \times X \text{ acres} = 6.57 \text{ AF} \\ X &= 0.219 \text{ acres} \\ X &= \mathbf{9,539.64 \text{ ft}^2} \text{ of irrigated landscaped area per lot} \end{aligned}$$

This is for Phase 1 allocations. The other phases will have different water use values as they vary in the number of lots and proposed use. Each proposed project/phase will not utilize more than 10-acre feet of water – per the current DNRC standards.

Horse Creek Hills Subdivision 2, consisting of eleven (11) lots on approximately 92.05 acres. This includes Lots 13-16 and Lots 20-26, including eleven (11) residential lots. We would anticipate the domestic water usage for the sum of the residential lots to be the following:

Domestic Use for Residential:

$$\begin{aligned} &= 250 \text{ gal/day/home} \times 1 \text{ home/lot} \times 11 \text{ lots} \times 365 \text{ days/year} &&= 1,003,750 \text{ gal/year} \\ &= 1,003,750 \text{ gal/year} \div (7.48 \text{ gal/ft}^3 \times 43,560 \text{ ft}^2/\text{acre}) &&= \mathbf{3.08 \text{ AF}} \end{aligned}$$

The remaining appropriations for irrigation use would be **6.92 AF** (10.0 AF – 3.08 AF = 6.92 AF). If each of the lots were assumed to consist of the same amount of irrigated landscaped area, the area of lawn for each lot would be as follows:

$$\begin{aligned} \text{Irrigation Use} &= 6.92 \text{ AF} = (1 \text{ inch/week} \div 12 \text{ inches/ft}) \times 30 \text{ weeks/year} \times X \text{ acres/lot} \times 11 \text{ lots} \\ &= 27.5 \text{ ft} \times X \text{ acres} = 6.92 \text{ AF} \\ X &= 0.252 \text{ acres} \\ X &= \mathbf{10,961.28 \text{ ft}^2} \text{ of irrigated landscaped area per lot} \end{aligned}$$

The proposed Phase 2 will not utilize more than 10-acre feet of water – per the current DNRC standards.

Horse Creek Hills Subdivision 3, consisting of eleven (11) lots on approximately 119.59 acres. This includes Lots 17-19 and Lots 27-34, including eleven (11) residential lots. We would anticipate the domestic water usage for the sum of the residential lots to be the following:

Domestic Use for Residential:

$$\begin{aligned} &= 250 \text{ gal/day/home} \times 1 \text{ home/lot} \times 11 \text{ lots} \times 365 \text{ days/year} &&= 1,003,750 \text{ gal/year} \\ &= 1,003,750 \text{ gal/year} \div (7.48 \text{ gal/ft}^3 \times 43,560 \text{ ft}^2/\text{acre}) &&= \mathbf{3.08 \text{ AF}} \end{aligned}$$

The remaining appropriations for irrigation use would be **6.92 AF** (10.0 AF – 3.08 AF = 6.92 AF). If each of the lots were assumed to consist of the same amount of irrigated landscaped area, the area of lawn for each lot would be as follows:

$$\begin{aligned} \text{Irrigation Use} &= 6.92 \text{ AF} = (1 \text{ inch/week} \div 12 \text{ inches/ft}) \times 30 \text{ weeks/year} \times X \text{ acres/lot} \times 11 \text{ lots} \\ &= 27.5 \text{ ft} \times X \text{ acres} = 8.04 \text{ AF} \\ X &= 0.252 \text{ acres} \\ X &= \mathbf{10,961.28 \text{ ft}^2} \text{ of irrigated landscaped area per lot} \end{aligned}$$

The proposed Phase 3 will not utilize more than 10-acre feet of water – per the current DNRC standards.

Horse Creek Hills Subdivision 4, consisting of seven (7) lots, plus Open Space, on approximately 112.38 acres. This includes Lots 35-41, including one (1) commercial lot, and six (6) residential lots.

The commercial lot (Lot 41) is proposed to be 32.04 acres will not be evaluated under this appropriations letter. Lot 41C will instead have a separate exempt water right – utilizing but not exceeding up to 10-acre feet of water. The lots are anticipated to be serviced via on-site individual water supply wells and on-site individual subsurface wastewater treatment systems, with the exception of the open space lot.

Assuming that each of the 6 residential lots would consist of one (1) single family dwelling we would anticipate the domestic water usage for the sum of the residential lots to be the following:

Domestic Use for Residential:

$$\begin{aligned} &= 250 \text{ gal/day/home} \times 1 \text{ home/lot} \times 6 \text{ lots} \times 365 \text{ days/year} &&= 547,500 \text{ gal/year} \\ &= 547,500 \text{ gal/year} \div (7.48 \text{ gal/ft}^3 \times 43,560 \text{ ft}^2/\text{acre}) &&= \mathbf{1.68 \text{ AF}} \end{aligned}$$

Total Domestic Use for Project #4 is **1.68 AF**

The remaining appropriations for irrigation use would be **8.32 AF** (10.0 AF – 1.68 AF = 8.32 AF). If each of the lots were assumed to consist of the same amount of irrigated landscaped area, the area of lawn for each lot would be as follows:

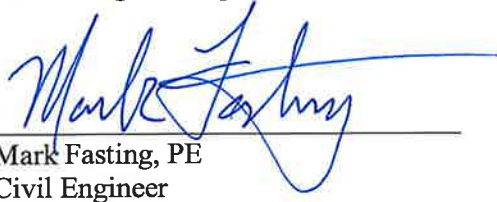
$$\begin{aligned} \text{Irrigation Use} &= 8.32 \text{ AF} = (1 \text{ inch/week} \div 12 \text{ inches/ft}) \times 30 \text{ weeks/year} \times X \text{ acres/lot} \times 6 \text{ lots} \\ &= 15 \text{ ft} \times X \text{ acres} = 8.32 \text{ AF} \\ X &= 0.554 \text{ acres} \\ X &= \mathbf{24,161.28 \text{ ft}^2} \text{ of irrigated landscaped area per lot} \end{aligned}$$

The proposed residential Lots in Phase 4 will not utilize more than 10-acre feet of water – per the current DNRC standards. Lot 41 could use up to 10 acre-ft of water.

Please feel free to call if you have any comments or questions.

Thank you.

Sincerely,
Allied Engineering Services, Inc.



Mark Fasting, PE
Civil Engineer