

Peer reviewed?

BRIDGER MOUNTAIN VILLAGE

PLANNED UNIT DEVELOPMENT

COMMUNITY WASTEWATER SYSTEM

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EXECUTIVE SUMMARY

The proposed wastewater treatment and disposal system for the Bridger Mountain Village project is a state of the art facility. All wastewater will be collected and conveyed to a central location for treatment. The wastewater treatment plant will consist of a membrane based biological nutrient removal process. Upon treatment the effluent will be discharged into underground rapid infiltration for further treatment and ultimate disposal. All wastewater improvements require approval of the Montana Department of Environmental Quality. This is an approval process that includes both a technical review of the technology and a thorough review of the systems impact on both groundwater and surface water quality. Long term assurances that the wastewater treatment plant are provided via the Department of Environmental Quality's reporting requirements that will be part of the required groundwater discharge permit.

INTRODUCTION

A community wastewater system is proposed for the Bridger Mountain Village project. The central wastewater system is a critical ingredient necessary for base area clustered development. The desired densities in the Bridger Bowl Base Area Plan, require that a central system be utilized in order to meet water quality objectives. In concert with the applicant's goals for the project the wastewater system is proposed to serve all land within the base area zoning district.

WASTEWATER GENERATION

Wastewater generation is based on industry and literature sources for the project. Average day wastewater generation rates for the domestic and commercial needs of the base area are shown in the table below for 100% occupancy rates. It should be noted that in concert with planning for the overall base area infrastructure needs that demands of all potential users are included in the table.

USERS

	Building Units	Number Per Unit	Gallons Per Day Per Unit	Gallons Per Day	Total GPD
Recreation Sites (single family homes)	75	2.5	100	250	18,750
Overnight accommodations					
1. Trapper Cabins	128	2.5	60	150	19,200
2. Chalets	80	2.5	60	150	12,000
3. Condo in base area over commercial	80	2.5	60	150	12,000
4. Main Lodge	100	2.5	50	125	12,500
Hotel density bonus @	50	2.5	50	125	6,250
Pool / Spa	1	100	10	1,000	1,000
Restaurant	1	300	3	900	900
Bar	1	50	3	150	150
H-1 Lodge	48	2.5	50	125	6,000
				0	
Bed & Breakfast / Back country huts	<u>16</u>	2	60	120	1,920
	505				
Commercial - Base Area					
1. Restaurants seats	500	2	3	6	3,000
2. Bars seats	1	300	3	900	900
3. Launderette overnight only	1	4	580	2,320	2,320
4. Shops square feet	1	32,000.0	0.2	6,400	6,400
5. Police & Fire	1	10	15	150	150
O & M Administration					
6. Nordic Center	1	10	10	100	100
7. Church	1	100	3	300	300
8. Ice skating area					0
9. Misc.	5	1	200	200	1,000
Commercial - Convenience Store	1	1	500	500	500
Base area employee housing (250 employees @ 10% = 25 x .5)	13	2	100	200	2,600
					107,940

	Units	Number Per Unit	Gallons Per Day Per Unit	Gallons Per Day	Total GPD
Lachenmaier					
1. Recreation sites	13	2.5	100	250	3,250
2. Overnight accommodations	37	2.5	60	150	5,550
Hepburn					
1. Recreation sites	2	2.5	100	250	500
2. Overnight accommodations	5	2.5	60	150	750
Bridger Bowl					
1. Overnight accommodations	39	2.5	60	150	5,850
Employee Housing (250 employees @ 10% = 25 x .5)	13	2	100	200	2,600
Bridger Pines					
1. Recreational Site	30	2.5	100	250	7,500
2. Condominium Site	28	2.5	100	250	7,000
Potential Adjacent Users	7	2.5	100	250	1,750
					34,750
TOTAL AVERAGE DAILY WASTEWATER GENERATION					142,690

The average daily wastewater generation for the entire base area zoning district is 142,690 gallons per day. This value is conservative as it is based on full occupancy of all of the units. Considering that the shoulder seasons in the spring and fall do not provide the same recreational opportunities as the winter and summer seasons the annual average wastewater generation is anticipated to be much less than the value noted above. This variation in wastewater flows will be an important design consideration in designing the wastewater treatment facility.

COLLECTION SYSTEM

Wastewater will be collected through a gravity collection system supplemented by lift stations. The system will consist of PVC sewer mains, manholes, service lines, lift stations and occasional individual lift stations for some remote areas of the development as dictated by topography. The collection system will bring all wastewater from the project area to the centralized treatment facility.

The collection system is permitted through the Department of Environmental Quality which provides standards and guidelines for design and construction. Lift stations for the project will be equipped with backup pumps and standby generators to allow for continued use during power outages and equipment malfunctions. The collection system will be designed to carry peak flows.

A telemetry control system will be utilized to operate and monitor the overall community wastewater system. Each lift station will be equipped with controls and sensors to notify the operator of any problems or concerns.

WASTEWATER TREATMENT SYSTEM

The community wastewater treatment system will consist of a membrane based biological nutrient removal facility. The treatment technology proposed is ideal for this project due to the high level of treatment required and the seasonal fluctuations in flows. A Draft Basis of Design Report for the wastewater treatment facility is included in the appendix.

WASTEWATER EFFLUENT DISPOSAL SYSTEM

The wastewater disposal system will consist of underground rapid infiltration cells. The system will provide for final treatment and disposal of the effluent from the wastewater treatment plant. The system will consist of disposal trenches that will be excavated to permeable material and backfilled with permeable sand. In the upper

reaches of the trench infiltrations chambers will be installed to evenly distribute the effluent across the underground basins. Initial soil exploration studies and water quality studies indicate that the proposed system is feasible.

WASTEWATER SOLIDS TREATMENT AND DISPOSAL SYSTEM

In addition to disposal of effluent from a wastewater treatment plant it is important to address the solid side of the process. It is proposed that the wastewater treatment plant produce Class B dewatered biosolids. Biosolids treated to these levels are suitable for application to agricultural operations as soil amendments and fertilizer. It is unknown at this time the ultimate destination for the biosolids from the wastewater treatment plant; however, it will either be sold or provided to agricultural users or disposed of at an appropriate solid waste landfill.

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