

**VILLAGE CAMP DURANGO
SEWAGE DISPOSAL MEMO**

January 17, 2025



Building a Better World
for All of Us®

Prepared by:
SEH, Inc
934 Main Ave., Unit C
Durango, CO 81301

Prepared For:
Roberts Resorts and Properties

Background

This Sewage Disposal Memo, prepared by SEH, Inc., serves to describe the quantity and quality of sewage created by the development of the Village Camp Durango project. The project includes the development of 277 RV sites located off County Road 252 in unincorporated La Plata County, CO. The site will include the following sewage generating elements:

Table 1: Village Camp Durango Sewage Discharge Sources

RV Sites (Travel trailer park with sewage hookup)	277
Clubhouse: Lavatory	4
Kitchen Sink (includes handwashing and utility sinks)	5
Hot Tub (Swimming Pools and Bathhouses)	1
Bathhouse: Lavatory	6
Kitchen Sink (includes handwashing and utility sinks)	1
Laundry Washer	4

The project will discharge sewer effluent to the Hermosa Sanitation District (HSD) to the north of the project site. The site is directly south of the HSD treatment plant property. The anticipated sewage effluent was determined using historic measured effluent data from a comparable site, as well as design guidance set forth by the Colorado Department of Public Health and Environment (CDPHE).

Currently, there is a will-serve letter in place, agreeing to an Equivalent Residential Tap (ERT) of 0.4 for each RV site, calling for 111 taps to be purchased. A residential tap accounts for 250 gallons per day (GPD) of sewage with a Five-Day Biochemical Oxygen Demand (BOD or BOD₅) of 0.67 pounds per day, or 319 milligrams per liter (mg/L). HSD has requested additional verification that the sewage effluent will not be of a strength or character that exceeds their standards and that additional site amenities are accounted for with tap purchases. HSD requires that sewage effluent with maximum values of 250 mg/L BOD, 200 mg/L TSS, and a pH between 6 and 8. Thus, 111 taps should be sufficient to treat 27,750 GPD that are within effluent parameters.

Effluent analysis has been performed in accordance with the CDPHE Design Criteria for Domestic Wastewater Treatment Works (Policy WPC-DR-1). This is a guiding document for primarily capital sewer treatment project (i.e. significantly revising a treatment plant or installing a new one), which was deemed the most appropriate guidance, as it will govern future HSD improvements and there is not a more localized governing document that covers the proposed land use in detail. The Policy states in sections 2.1.2 and 3.2.2 that analysis should depend first on historic data as available and, if historic data is unavailable, *CDPHE regulation 43 – On-Site Wastewater Treatment System Regulation* should be followed for larger, public facilities. We have analyzed first the historic data available and second the Regulation 43 guidelines for the project.

Historic Data

The project owner, Roberts Resorts and Properties, owns and operates several resorts of a similar size and nature. Specifically, they own a resort near Houston, TX named Rayford Crossing. Rayford Crossing is not significantly larger by site count at 286, but we would note that resort offers a full-size swimming pool, 2 bathhouses, and a larger laundry facility than what is proposed for Village Camp Durango. That said, we feel the development is an excellent parallel for the proposed project. We received raw data from the operators in an email, which is not shared in this public document but can be made available to HSD staff to protect privacy. The data is shown below in Table 1.

Table 2: Rayford Crossing Sewer Effluent

Month	Avg Flow (GPD)	BOD (lbs)	BOD (mg/L)	TSS (lbs)	TSS (mg/L)	Gal / site occupied / day	Net Site Occupancy
Oct-22	1,000	15.71	1,882	3.41	408		
Nov-22	1,000	2.47	296	6.61	791	7.94	3,776
Dec-22	1,000	2.76	330	3.02	362	7.37	4,072
Jan-23	1,000	4.05	485	23.39	2,803	7.45	4,027
Feb-23	1,000	2.96	355	3.06	367	8.05	3,725
Mar-23	1,780	3.33	224	2.90	195	12.71	4,201
Apr-23	1,850	2.61	169	3.59	232	12.12	4,578
May-23	2,020	2.32	138	3.50	208	12.67	4,784
Jun-23	2,180	2.51	138	3.22	177	13.17	4,966
Jul-23	2,340	2.03	104	1.49	76	11.44	6,137
Aug-23	2,510	2.03	97	1.27	61	11.85	6,355
Sep-23	2,670	2.65	119	6.56	294	13.32	6,013
Oct-23	2,850	3.88	163	3.18	134	13.58	6,294
Nov-23							6,240
Total	18,200	21.36		25.71			43,328
Average			144		172	12.61	
Weighted Average by GPD			141		169		

Months dropped from analysis (suspect faulty data)

Raw Data

Calculated Values

Per Table 1; 277 sites, fully occupied, would generate 3,493 GPD, clearly under the 27,750 GPD already agreed upon:

$$12.61 \text{ gal / site} \times 277 \text{ sites} = 3,493 \text{ GPD}$$

We would further note that these effluent numbers are for the resort as a whole – bathhouses, swimming pools, clubhouse amenities, and laundry all included. With effluent strength under HSD thresholds and net flows roughly 1/8th of those previously assumed, the historic data available suggests that infrastructure should be more than sufficient to handle projected loading.

Regulatory Guidance

Regulation 43, which normally governs on-site wastewater treatment facilities (e.g. single-family septic tank and leach field systems), is also deferred to by CDPHE for public systems in the event of a lack of data available for analysis. This approach was expected to be conservative, and to align roughly with other regulatory guidance (such as the ERT calculations).

Regulation 43 gives estimated wastewater net flows and BOD loading on a per person, per day basis in Table 6-2 of that document. Those values have been for the calculations tabulated below. One item that the regulation 43 guidance requires is a head count. While 277 or higher may seem to be a reasonable number for site amenities, a cursory review of laundry machines revealed that this head count would call for 21,600 GPD for 4 washers. This consumption level would require each washing machine to run 270 time per day, or over 11 loads per hour. This is clearly not a reasonable way to monitor site usage. A head count of 10 was used, and it equates to roughly 10 loads per day. It also implies 20-30 flushes per day in lavatories. These numbers correlate to reasonable use, especially in conjunction with RV sewage generation already included in the RV Site ERT's. Table 3, below, shows the net sewage generation from RV sites plus site amenities.

Table 3: Village Camp Durango Sewage Discharge Sources

Fixture	Fixture count (from Developer)		Daily load per person per fixture (Reg 43)		Total daily load (calculated)		
	Club-house	Bath-house	GPD*	BOD* (lbs)	GPD total	BOD (lbs/day)	BOD (mg/L)
Lavatory	4	6	8.4	0.021	840	2.1	300
Kitchen Sink	5	1	5.8	0.052	348	3.12	1074
Laundry Washer		4	19.5	0.037	780	1.48	227
Hot Tub (swimming pools and bathhouses)	1	0	10	0.06	100	0.6	719
			loading for site amenities:		2,068	7.30	423
			ERT for site amenities:		8.3	11	
			loading for 277 RV sites		27,700	66.5	288
			Total Loading		29,768	73.8	297

*units are per person per day

The regulatory guidance is reveals that the site amenities are 1% or less of site sewage generation. It also reveals that the actual historic data, averaging 12.6 GPD, is even lower than expected compared to the baseline of 100 GPD in both HSD and CDPHE guidance. We suspect that this is not only because the generation estimators are intended to be conservative, but also because the travel trailer (RV) generator in regulation 43 is intended to be used as land-use generator, not supplemented with site amenities. Previous HSD guidance and historical data both support this approach.

Conclusion

While the regulatory guidance renders slightly high BOD and ERT's, we suggest that the historic data supports the sufficiency of the current agreement to a much greater extent, with firmer root in reality. We would suggest as a path forward that the current commitment letter be viewed as sufficient to begin construction and monitoring of the Village Camp Durango project, with monitoring of the daily net flows, BOD, and TSS being collected, documented, and shared with HSD for verification.