

July 14, 2021

Mr. Dave Mendiola
County Manager
Humboldt County Nevada
50 W. 5th Street
Winnemucca, NV 89445

RE: GRASS VALLEY PRELIMINARY WASTEWATER TREATMENT FACILITY INFORMATION

Dear Mr. Mendiola:

Farr West Engineering (Farr West) has been retained by Humboldt County, Nevada, to prepare a Preliminary Engineering Report for a proposed wastewater collection system located southwest of the City of Winnemucca, in Grass Valley, Nevada. Farr West is currently in the process of developing the report which includes a wastewater treatment component for the proposed collection system. This letter presents preliminary information for the justification, approximate size, and estimated cost of a wastewater treatment facility (WWTF) to serve the north Grass Valley area.

Need for the Project

In December 2014 Farr West completed a groundwater nitrate assessment study of the Grass Valley area testing a total of 134 nitrate-nitrite unique well samples finding multiple maximum contaminant level (MCL) exceedances. The MCL exceedances found during the study prompted continued monitoring of the nitrate levels in Grass Valley's groundwater. The Federal and State MCL standard for nitrate levels in drinking water is 10 milligrams per liter (mg/L); results from Grass Valley groundwater samples show levels as high as 25 mg/L. The high density of septic systems currently operating in Grass Valley result in a release of inadequately digested wastewater through the leach fields. This water is then absorbed back into the groundwater supply with elevated levels of nitrates. Nitrates are a carcinogen and when present in drinking water pose an immediate threat to the public's health. Utilization of a WWTF would improve the high levels of nitrates found in Grass Valley's drinking water.

The potential for an increase in economic growth exists with providing a WWTF in the Grass Valley area. Economic growth in Grass Valley is sometimes limited by the reliance on septic systems for wastewater treatment. Industrial and commercial developments often require a greater capacity for wastewater treatment than can be provided by a septic system. Therefore, some of the potential businesses that might wish to locate near the Winnemucca Airport in Grass Valley are constrained from developing due to the limitations of septic systems. Additionally, as new businesses develop within the region, Grass Valley will be a location where employees will establish their residences due to the availability many residential lots.

Estimated Wastewater Characterization

Based on the gathered site information and wastewater flow design values utilized by the City of Winnemucca and various Nevada counties, an estimated average day volume of 178,400 gallons per day (GPD) may be generated from existing development within the Grass Valley area. The associated maximum day volume and peak hour flow are estimated at 267,600 GPD and 310 gallons per minute (GPM), respectively. The calculation of these values is shown below in Table 1. An average flow estimated from probable future development within Grass Valley was combined with the flow estimate for existing units to get a total average day flow of 350,245 GPD. A map showing the preliminary service area boundaries is attached for reference.

Table 1. Estimated Wastewater Flows

Description	No. of Units	Vol / Unit	Average Flow (GPD)
Undeveloped Residential Lots*	44 ERU	300 gpd	13,200
Residential Units	523 ERU	300 gpd	156,900
General Commercial District	0.24 Acre	780 gpd/acre	187
Public Facility	2.03 Acre	2600 gpd/acre	5,278
Neighborhood Commercial/Rural District	0.18 Acre	2600 gpd/acre	468
Public Facilities Airport/Industrial District	5.18 Acre	457 gpd/acre	2,367
	Estimated Avg. Day Volume		178,400 GPD
	Estimated Max. Day Volume		267,600 GPD
	Estimated Peak Hour Flow		310 GPM
Undeveloped Areas			
Description	No. of Units	Vol / Unit	Average Flow (GPD)
Future Residential Development**	77 ERU	300 gpd	23,100
Other Future Residential Development**	396 ERU	300 gpd	118,800
General Commercial District	1.09 Acre	780 gpd/acre	850
Public Facility	0.17 Acre	2600 gpd/acre	442
Neighborhood Commercial/Rural District	1.88 Acre	2600 gpd/acre	4,888
Public Facilities Airport/Industrial District	52 Acre	457 gpd/acre	23,764
	Estimated Avg. Day Volume		171,844 GPD
	Estimated Max. Day Volume		257,766 GPD
	Estimated Peak Hour Flow		298 GPM
Existing and Future Combined:	Estimated Avg. Day Volume		250,245 GPD
	Estimated Max. Day Volume		525,367 GPD
	Estimated Peak Hour Flow		608 GPM

* Based on 2019 Aerial Imagery

** Future Residences - Bonanza Dr. to Nugget Dr. and Lynx Dr. to Venus St.

*** Future Residences - West/Southwest of Gold Country Estates

Since the collection system will initially serve residential and commercial areas that have been developed over the last 40 years, the strength of the wastewater is assumed to have an average water content and should not contain highly concentrated waste typical of modern low water use plumbing and appliances. Areas of future development are anticipated to discharge concentrated wastewater due to the use of modern low water use plumbing and appliances.

Wastewater Treatment Facility

Preceding the WWTF will be a screen and auger to remove large solids and some grit. The preliminary WWTF design selected for Grass Valley is a Sequencing Batch Reactor (SBR). An SBR treatment system includes a tank, aeration and mixing equipment, a decanter, clarifier, and a control system. This system operates by adding wastewater to the tank, known as the single "batch" reactor; the wastewater is then treated to remove sludge and discharged to a Rapid Infiltration Basin (RIB). An SBR has a smaller footprint compared to other types of treatment facilities due to its ability to achieve equalization, biological treatment, and secondary clarification with timed control sequencing in a single tank. Along with being able to treat wastewater within a smaller footprint, an SBR typically provides cost savings compared to other methods of treatment. SBRs are designed to handle flowrates up to 5 million gallons per day (MGD) which readily exceeds the estimated total average flow of 0.35 MGD. If the WWTF is sized to accommodate existing development and approximately 40 undeveloped lots, it can be reduced to approximately 0.178 MGD. Most SBRs can process peak flows up to 300 percent of average flows.

Sludge handling has also been considered as a component of the treatment facility. Sludge will be pumped from the clarifiers into a building that houses a sludge press. The filtrate will be returned to the treatment train and the sludge cake will be discharged into a bin. The sludge cake is typically of such quality that it can be disposed of in a landfill.

Typical effluent from an SBR plant is of sufficient quality for reuse and could potentially be used by alfalfa farms in the area. If the effluent quality is high enough it can also be used for parks and area landscaping. Most of the effluent will be discharged into infiltration basins.

Opinion of Probable Cost

The opinion of probable cost for the preliminary proposed WWTF is \$5,651,800. The estimate details area attached. With a 10 percent contingency the estimated amount is \$6,216,980.

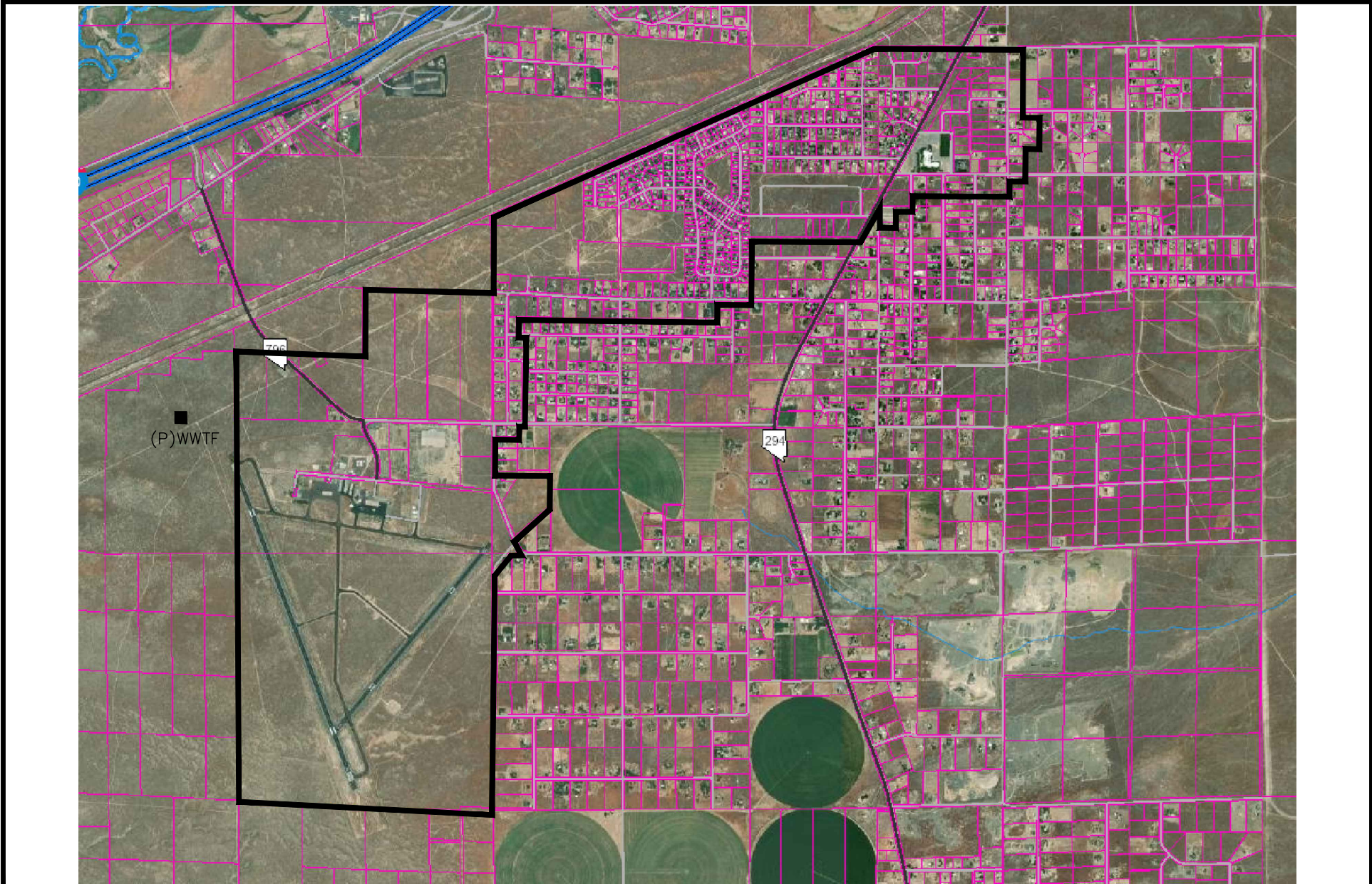
Please feel free to contact me at (775) 284-7182 or (775) 530-6738, if you have any questions regarding this preliminary information about the potential Grass Valley WWTF.

Sincerely,



David L. Pulley, P.E.

Encl.



JOB NO.: 4028
 DESIGN: 002
 DRAWN: KMM
 CHECKED: DLP
 DATE: 07/12/2021

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GRASS VALLEY HUMBOLDT COUNTY
 PRELIMINARY WASTEWATER
 SERVICE AREA

HUMBOLDT COUNTY

NEVADA

SHEET 1

Preliminary Opinion of Probable Cost - Grass Valley WWTF

Line	Description	Quantity	Unit	Cost/Unit	Total Cost
1	Mobilization/Demobilization	1	LS	\$ 290,000	\$ 290,000
2	Rough Grading & Earthwork- Rapid Infiltration Basins	1	LS	\$ 250,000	\$ 250,000
3	Plant Site Work	1	LS	\$ 27,000	\$ 27,000
4	Concrete	1	LS	\$ 65,000	\$ 65,000
5	Auger in vault	1	LS	\$ 240,825	\$ 240,825
6	Supply and Install 350,000 gallon Wastewater Treatment Plant With Clarifier	1	LS	\$ 2,795,000	\$ 2,795,000
7	Supply and Install Chlorine Containment Unit 150 gal. Double Walled Storage tank, Peristaltic Pumps, Chemical Tubing, Injectors, Saddle, Pipe, etc.	1	LS	\$ 61,100	\$ 61,100
8	Supply and Install Sludge Pump and Vault	1	LS	\$ 90,025	\$ 90,025
9	Building, Building Pad, Slab, Mechanical, Plumbing, Electrical	1	LS	\$ 295,500	\$ 295,500
10	Supply and Install Sludge Press and Polymer Pump	1	LS	\$ 436,150	\$ 436,150
11	Supply and Install Generator and ATS	1	LS	\$ 133,900	\$ 133,900
12	48" Type 1-B Manhole	2	EA	\$ 9,118	\$ 18,236
13	48" Type III Manhole	1	EA	\$ 14,659	\$ 14,659
14	Stainless Steel Slide Gate	1	EA	\$ 10,758	\$ 10,758
15	8" Magnetic Meter	1	EA	\$ 10,563	\$ 10,563
16	2" Steel Ceramic Epoxy Lined Pipe	20	LF	\$ 267	\$ 5,330
17	Flow Control Valve Assembly	1	LS	\$ 16,478	\$ 16,478
18	Site Electrical	1	LS	\$ 412,325	\$ 412,325
19	NV Energy Service Extension	1	LS	\$ 120,000	\$ 120,000
20	Project SCADA	1	LS	\$ 203,125	\$ 203,125
21	Computer/Server/Software Allowance	1	LS	\$ 36,400	\$ 36,400
22	3/4" Yard Hydrant	3	EA	\$ 2,828	\$ 8,483
23	Standard Cleanout	2	EA	\$ 991	\$ 1,983
24	Wells	1	EA	\$ 71,500	\$ 71,500
25	Best Management Practices	1	LS	\$ 19,000	\$ 19,000
26	3" Plantmix Bituminous Patch/Driveway Apron	3200	SF	\$ 6	\$ 18,462

Subtotal	\$	5,651,800
10% Contingency	\$	565,180
Total	\$	6,216,980