June 25, 2014

Lance Spears
Mi Sueno Winery
910 Enterprise Way
Napa, CA 94558

RE: Summary Findings
Wastewater Flow Concentration for Sausage Manufacturing

Lance,

At your request, our office has performed research into typical wastewater concentrations from sausage manufacturing to determine the capacity requirements and the approximate number of Napa Sanitation District’s ‘Equivalent Dwelling Units’ used by this facility for sausage manufacturing. The capacity is based upon two variables, water use and strength factor of the waste flow. Three relevant documents were used to calculate the historical strength factor (see References).

The subject building, located at 910 Enterprise Way, Napa, CA, was approved by the City of Napa for both wine production and sausage manufacturing in 1987 and paid connection fees to NSD in 1987. Sausage manufacturing was expanded in 1998 and peak use was 2004/2005. In 2005 the sausage manufacturing ceased and in 2006 Mi Sueno continued the wine production use in a portion of the building. Carpet One is located in the remaining space.

Based on our review of the study “Treatment of High Strength Meatpacking Plant Wastewater By Land Application” (Meatpacking study), a direct correlation can be made to meatpacking Biochemical Oxygen Demand (BOD). The study found the average BOD for meatpacking operations was approximately 1,000 mg/L.

The second study “Biological nutrient and organic removal from meat packing wastewater with a unique sequence of suspended growth and fixed-film reactors” (Arizona State University, published in Water Science Technology) found that meatpacking wastewater had a BOD of 853 mg/L.

For suspended solids, the Meatpacking study noted a range of 15 – 10,350 mg/L with an average of 1,600 mg/L (Table 2, page 18). A review of a third study “Oxidation Ditch Treatment of Meatpacking Wastes” by Wayne Paulson and published by the U.S. EPA notes suspended solids generated from meatpacking activities at 1,190 mg/L (Table 6, page 25).

Based on our review of these studies, the former sausage manufacturing use which operated at 910 Enterprise Way, Napa, most likely generated BOD concentrations in the range of approximately 850 - 1,000 mg/L and suspended solids between 1,190 – 1,600 mg/L.

Using the low end of these values (BOD = 850 mg/L and TSS=1,190 mg/L) in the Napa Sanitation District’s ‘Equivalent Dwelling Unit’ strength factor multiplier term:

\[
\text{Strength factor (WF)} = 0.5 + 0.25\left(\frac{\text{BOD}}{175}\right) + 0.25\left(\frac{\text{TSS}}{200}\right)
\]

Yields a strength factor of 3.2:

\[
\text{Strength factor} = 0.5 + 0.25\left(\frac{850}{175}\right) + 0.25\left(\frac{1,190}{200}\right) = 3.2
\]
The water consumption for the sausage operation at 910 Enterprise Way for the years that this use was carried out in the entire building was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Water Use (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>421,300</td>
</tr>
<tr>
<td>1998</td>
<td>471,500</td>
</tr>
<tr>
<td>1999</td>
<td>205,900</td>
</tr>
<tr>
<td>2000</td>
<td>1,452,800</td>
</tr>
<tr>
<td>2001</td>
<td>3,798,700</td>
</tr>
<tr>
<td>2002</td>
<td>3,744,000</td>
</tr>
<tr>
<td>2003</td>
<td>3,152,848</td>
</tr>
<tr>
<td>2004</td>
<td>3,945,140</td>
</tr>
<tr>
<td>2005</td>
<td>2,580,613</td>
</tr>
</tbody>
</table>

Average: 2,196,978 gallons/year
Daily Flow: 8,450 gpd (5 days/week, 52 weeks)

Applying the six year average water consumption to the NSD Flow Factor of

\[
\text{Flow factor (FF)} = \frac{\text{Estimated GPD}}{210}
\]

Yields a flow factor of 40.2:

\[
\text{Flow factor} = \frac{8,450}{210} = 40.2
\]

The product yields an ‘Equivalent Dwelling Unit’ (EDU = WF x FF) of 129 EDU’s for the former sausage operation at 910 Enterprise Way.

Please let me know if you have any questions or would like copies of the referenced documents.

Sincerely,
Andrew Simpson, P.E.
Principal
References

“Treatment of High Strength Meatpacking Plant Wastewater By Land Application”. Anthony J. Tarquin, Department of Civil Engineering, University of Texas at El Paso (EPA, document EPA-600/2-76-302, December 1976)


Winery Wastewater Pollutant Characteristics, Winery Waste Management Technical Memorandum, 2009