



Clean Water Coalition

O F N O R T H E R N
S O N O M A C O U N T Y

January 29, 2014

Terry Crowley
City of Healdsburg Department of Public Works
401 Grove Street Healdsburg, CA 95448

RE: Follow up on the January 13, 2014 Clean Water Coalition Meeting

Thank you for your presentation to the Clean Water Coalition of Northern Sonoma County (CWC), and we look forward to working constructively with the City of Healdsburg and its consultants. This letter represents our preliminary analyses of concerns and questions raised at the meeting. Based on the information presented and subsequent research, the CWC believes that Healdsburg has underestimated the costs, scope and required acreage required for Ag-Irrigation alternative in its comparison of options for complying with its discharge permit requirements. (See pages 2)

In addition, since the meeting CWC members have done preliminary research on reverse osmosis (RO) and we believe RO could be very competitive in price with a revised Ag-Irrigation cost estimate.

Given our mutual desire to preserve the high quality groundwater in our drinking water aquifer, the CWC requests that Healdsburg prepare a new cost comparison of the ag-reuse project, that includes all cost elements and with a design that more accurately reflects the application rates concluded in the Middle Reach Russian River Vineyard Irrigation Demonstration Project Study (Ag Agronomic Rate Study). The CWC also requests that Healdsburg include the costs and feasibility of the reverse osmosis alternative described below in its analysis of options for complying with its discharge requirements.

Reverse Osmosis (RO) Plant option: Healdsburg's wastewater pre-treatment technology makes it a perfect candidate for a 1 million gallon/day RO plant. The Clean Water Coalition encourages Healdsburg to carefully research the viability of an RO plant, as potable water offset options are preferable to an Ag Irrigation alternative for the following reasons:

- Preserves the best opportunity for urban re-use and for charging other customers for the treated water which could reduce long-term costs;
- Recaptures some costs for ratepayers in future;
- Creates high quality water opening up other potable water offset options vs. Ag Irrigation which may lose up to 50% of the water to transpiration and evaporation;

- New RO technologies with higher efficiency rates and lower energy costs exist;
- On-going O&M of an RO plant is handled on-site by the plant staff vs. extensive and complex monitoring and maintenance of varied vineyard irrigation systems across large acreages, not in the City's control;
- Recharges and directly benefits the Russian River system;
- RO has stronger public relations benefits than Ag Irrigation

Our research, based on conversations with City of San Diego staff and RO equipment suppliers in addition to review of the project reports, lead us to believe that reverse osmosis may be a viable and competitive recycled water alternative to the Ag Irrigation option. The City of San Diego has successfully operated a 1 million/gallon/day RO plant, and we urge Healdsburg's public works staff to discuss the economics and operating considerations with their staff and suppliers, now Evoquo Water Technologies.

We provide the links below as a starting point for consideration and full engineering analysis of an RO project alternative:

- San Diego Water Purification Demonstration project – read project reports <http://www.sandiego.gov/water/waterreuse/demo/>
- Santa Clara Valley Advanced Water Purification System <http://www.valleywater.org/SVAWPC.aspx>
- Evoqua Water Technologies technical and marketing reports <http://www.water.siemens.com/en/wastewater/Pages/default.aspx>

We also encourage Healdsburg to work with the NCRWQCB staff in the review of San Diego's technical memoranda and compliance memos from their water quality control board. After pH adjustment, Healdsburg may have a viable recharge option in Basalt pond or via indirect discharge methodologies studied by Santa Rosa.

Healdsburg indicated they have an existing 30 million gallon storage pond that was planned to be used as part of the Ag-Irrigation project. This pond could be retrofitted for brine evaporation with trucking to a disposal site. Alternatively, Healdsburg may have a unique brine disposal option as the bridge across Dry Creek is a sunk cost. The Geyser's pipeline could be considered for brine disposal, given CalPine's previous indication of willingness to take brine from a proposed Healdsburg RO plant. Our preliminary analysis indicates generation up to 140,000 gallons/day of brine which may only need a small pipeline to transport the brine to the Geyser's pipeline, and a relatively small pumping plant to develop the matching pressure of the pipeline.

Request for new Ag Irrigation Cost Estimates: On January 13th, Healdsburg provided a preliminary estimate of the Vineyard Transmission System (piping plant to Foreman, Westside and Magnolia plus a pump station) at a cost of \$4,753,500. It was clarified that the engineering plan estimate above is for the about 600 acre project defined in Healdsburg's environmental documents.

As discussed at the meeting, the Ag Irrigation project costs must also include:

- **Vineyard transmission:** As outlined below, transmission estimates may not include total cost for transmission to the full required vineyard acreage.
- **Additional Storage:** Given discharge to Basalt must cease on May 15th, and vineyard irrigation may not commence until late June or July, an additional 30+ million gallon reservoir lined with clay and fabric liners, may be needed.
- **Vineyard distribution systems/ equipment:** Healdsburg's cost to retrofit grower's distribution systems to accept recycled water, including monitoring and agronomic rate measurement equipment and ongoing compliance costs.
- **Operations and Maintenance costs:** Calculate the on-going costs of monitoring/reporting compliance with User Agreements, repairing systems and mitigating wastewater spills.
- **Well protection mechanisms:** Plumbing or vineyard removal/ grape revenue replacement options for protection of residential wells.

Recalculation of Agronomic Rate and Reassessment of Participation Rate: The Clean Water Coalition is pleased that Healdsburg and the Regional Board agree to follow the Ag Agronomic Rate Study methodology, including use of the recommended equipment to determine water delivery rates and the agronomic rate of irrigation based on measurements of soil moisture and plant water status.

We, however, call into question Healdsburg's interpretation of the findings in the Ag Agronomic Rate Study, resulting in application of wastewater at much higher rates than the agronomic rates indicated in the study. The CWC therefore requests that the Technical Studies assess an Ag Re-Use project at true agronomic rates of delivery (1.7 – 2 inches/acre), not disposal rates of 3 inches/acre.

Furthermore, Healdsburg has assumed a 100 percent participation rate for growers within the proposed Ag Irrigation area. Given the apparent level of interest demonstrated to date, it would be prudent to assume a more realistic (i.e. lower) participation rate to ensure an accurate assessment of the Ag Irrigation project costs compared with other alternatives. As discussed below, using a correct agronomic rate and a more realistic grower participation rate will significantly increase the required acreage for the Ag Irrigation option. This larger area will result in higher project costs for the Ag Irrigation option than currently assumed in the presentation made on January 13th.

Calculation of gallons/vine: The Ag Agronomic Rate Study calculated water application rates in inches to correlate with the seasonal crop Evapotranspiration (ETc) model developed by University of California at Davis, and used as a "rule of thumb" for many growers. The study also showed that in the Russian River valleys, the ET model may not be that useful for irrigation scheduling or for estimating amounts. The field study, measuring soil moisture and plant stress, demonstrated that the Middle Reach agronomic rate of irrigation is at 20% of full ETc, and a similar study in the hotter Alexander Valley demonstrated an agronomic rate at 25-30% full ETc. (Areas with relatively high water tables allow for later and reduced irrigation relative to ETc.)

Also, growers have differing trellis systems, and the number of vines/acre can vary significantly based on spacing for hand picked vs. machine picked vineyards (e.g. spacing for 8ft x 6ft = 918 vines/acre and 6ft x 6ft = 1,225 vines/acre). Therefore, measurements in gallons/vine may be more useful; in general, the formula is:

X inches of water x 27,167 gallons/inch of water x 1 acre/Y vines = gallons/ vine

Agronomic Rate: The Ag Agronomic Rate Study found that the agronomic rate for most sites was 1.7 to 2 inches, with only the few sites with high gravel content requiring 3.0 to 3.5 inches. Assuming about 1,100 vines/acre, the average applied irrigation was 1.7 inches or 42 gallons/ vine to 2.0 inches or 50 gallons/vine.

Healdsburg's analysis assumes 3 inches/acre on 1,200 acres; completing the calculations at 1,100 vines/acre results in disposal of 98 million gallons of water and an application rate of 74 gallons/vine. We believe this is significantly more water than these vines will require in the project location given relatively high water tables allow for late and a reduced irrigation season. It is also noted that this high application rate will be detrimental to the vines and fruit.

In addition, we calculate that at 0.93 million gallons per day rate Healdsburg quoted in the meeting, delivered over the 138 day dry season (May 15 – September 30), Healdsburg will actually generate over 128 million gallons of treated wastewater. At the agronomic rate of application identified in the Ag Agronomic Rate Study of 1.7 to 2.0 inches (range of 42 to 50 gallons/vine) Healdsburg will need 2,227 to 2,770 acres of vineyard to dispose of all of the summer effluent (e.g. $128,000,000/1100/42=2,770$ acres).

Grower Participation Rate: Finally, assuming a more realistic grower participation rate of 50% vs. the 100% assumption, the total area required for ag-reuse is over 5,000 acres, far more than the 1200 acres assumed by the Healdsburg project alternative comparison (Again note that Healdsburg indicated that the Ag Irrigation transmission costs were based on only the 600 acres assumed in their original estimates).

Vineyard Specific Design and Monitoring: Healdsburg needs to address the cost and effectiveness of a true Ag-Reuse project considering the specific characteristics of the vineyards participating. Each vineyard has different water need depending on the location and soil type, grape varietal, plant spacing and trellis system. Each of these factors can have a significant impact on the amount and timing of waste water application required to properly match the agronomic rate. Furthermore, the costs of ongoing monitoring, maintenance and compliance of the distribution systems for the participating vineyards needs to be included in the cost estimates.

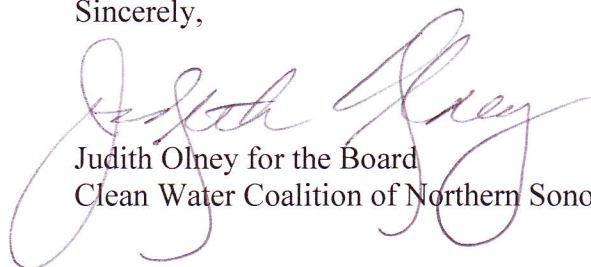
Ratepayer Considerations – Potable Water Offsets: The CWC requests Healdsburg prepare a new analysis of the Ag Irrigation project that includes costs that have been omitted such as storage, and distribution piping, and additional transmission and distribution facilities for a project area that reflects a properly sized ag-reuse area. Based on such a new, accurate cost estimate, the CWC believes that a reverse osmosis

alternative will be very competitive with Ag Reuse and the other options being considered by the City.

The Healdsburg presentation indicated that the urban water reuse was prohibitively expensive. The CWC requests, however, that Healdsburg continue to explore options with potable water offsets – as these offsets have the benefit of paying back every year to the ratepayers.

Thank you again for consideration of our concerns and requests for consideration of long-term preferable options. We understand the Technical Reports by Larry Walker and Associates are currently underway. And, representatives from the Clean Water Coalition would like to meet with Larry Walker Associates to discuss the scope of Healdsburg's technical studies including well and nutrient management mitigations to ensure any Ag Irrigation projects, if pursued, are designed, built, and operated in a manner that fully protect the aquifer and residential wells in the irrigation area.

Sincerely,

A handwritten signature in purple ink, appearing to read "Judith Olney". The signature is fluid and cursive, with the first and last letters of the first and last names being particularly large and stylized.

Judith Olney for the Board
Clean Water Coalition of Northern Sonoma County

Cc: NCRWQCB – Cathleen Goodwin
Healdsburg City Council - Jim Wood