

January 6, 2012

MEMORANDUM

TO: Todd Crutcher, P.E.
Engineering Manager, Boise Regional Office

FROM: Stephanie Ogle, P.E.
Technical Services

SUBJECT: Addendum to the Staff Analysis for Draft Wastewater Reuse Permit LA-000199-02
Rivervine Water and Sewer, LLC.

A draft wastewater reuse permit and the associated staff analysis for Rivervine Water and Sewer, LLC (Permit No. LA-000199-02) were presented for public comment on September 11, 2011 with the public comment period ending on October 11, 2011. One comment was received during the public comment period; the comment was submitted by the permittee. A representative of the facility stated that "It is not practical for Rivervine to be classified as a Class A system because of the significant cost burden that this would impose". A meeting between the permittee and the Department of Environmental Quality (DEQ) occurred on October 18, 2011 to discuss different options for the facility. It was decided that the permittee would modify some of their operations and the facility would be reclassified as a Class B facility.

1. SITE HISTORY

The first wastewater reuse permit for the Rivervine Subdivision wastewater treatment plant and associated reuse system was issued on December 17, 2004 and expired on December 17, 2009. That permit allowed treated wastewater to be discharged to the hydraulic management unit (HMU) (a 5-acre golf course driving range) or to an unlined storage pond (Pond #2). The water in this storage pond is used to irrigate common grounds throughout the subdivision, including the HMU, and, during construction of the irrigation system, it appears that the piping was modified to include residential irrigation as well. Approval of the design and construction of the wastewater treatment plant and reuse system and issuance of the first wastewater reuse permit occurred prior to the creation of defined classifications of treated wastewater effluent in IDAPA 58.01.17, *Recycled Water Rules*, and prior to the current rules associated with each classification. Table 3 in Section 602.02 of the *Recycled Water Rules* now designates residential irrigation and ground water recharge as allowed uses for Class A systems only, but the Rivervine Subdivision wastewater treatment and reuse system was not designed or constructed as a Class A system since those requirements did not exist at that time. Primarily, the wastewater treatment plant does not meet the disinfection or reliability and redundancy requirements in the current *Recycled Water Rules*. There are also some additional monitoring requirements associated with the Class A uses.

There are two permitting options in this scenario, the system must either address the wastewater treatment plant requirements for a Class A system and increase their monitoring for certain constituents, or the system may be classified as a Class B system and operations of the reuse system must be modified as necessary to ensure adequate protection of human health and the environment. The first draft permit proposed classifying the system as a Class A system and required that the facility

address the associated disinfection and reliability and redundancy requirements. The permittee has indicated that upgrades to the system are not financially feasible at this time considering the fact that only six of the 16 planned connections are connected to the system. As such, the system has been re-classified in the draft permit as a Class B system. Based on this classification, which does not contain the enhanced disinfection requirements or the reliability and redundancy requirements for the wastewater treatment process, the permittee is no longer allowed to use treated effluent for residential irrigation and irrigation of the HMU may only occur during periods that the public will not access the HMU. Based on the configuration of the irrigation system, treated wastewater will no longer be allowed to be discharged to Pond #2 during the growing season as the water from the pond is used to provide irrigation for the common lots in the subdivision as well as residential irrigation during that period. Discharge to Pond #2 will be allowed during the non-growing season however, as the permittee does not have another disposal option during that period. Due to the fact that the potential for direct human contact is greatly reduced for this use, the enhanced disinfection and reliability and redundancy requirements will not be required at this time. However, the permittee is required by the permit to comply with IDAPA 58.01.11, *Ground Water Quality Rule*, and Class A effluent limits and monitoring requirements are included in the draft permit during that period to provide adequate protection of the ground water quality. A compliance activity, as discussed below, is also proposed that requires the permittee to demonstrate that the IDAPA 58.01.11, *Ground Water Quality Rule*, requirements will be met during the non-growing season.

Section 2 includes a discussion about the changes between the previous draft permit and the current draft permit. Please refer to the staff analysis for the previous draft permit for further information on the wastewater treatment system, site descriptions, and the original draft permit conditions.

2. PERMITTING DISCUSSION – PROPOSED CHANGES TO THE DRAFT PERMIT

As stated previously, the treated effluent from the wastewater treatment plant is either sent directly to the HMU or to Pond #2. The pond is unlined and therefore the effluent must be highly treated to ensure protection of the ground water and the public. The classification for the system has been changed from Class A to Class B in the revised draft permit and many of the permit conditions in the original draft permit have been revised or removed to reflect the new classification. The Class A monitoring requirements have been addressed during the non-growing season to reflect the allowed use during that period. Modifications to the original draft permit limits and conditions are discussed below.

2.1 Section E - Compliance Schedule for Required Activities

Compliance Activity conditions CA-199-01 and CA-199-04 (previously CA-199-03) in Section E have not been modified from the original draft permit.

The second compliance activity, Condition CA-199-02 in Section E of the draft permit, previously would have required that the permittee submit a facility plan that addressed the Class A treatment system disinfection, reliability and redundancy requirements in the *Recycled Water Rules*. The system is no longer designated as a Class A facility in the new draft permit; therefore, the permittee does not need to address the Class A disinfection, reliability and redundancy requirements.

Condition CA-199-02 has been modified to require that the permittee conduct a ground water impact assessment, such as a Nutrient-Pathogen (NP) Evaluation, to demonstrate that the discharge of treated

effluent to the unlined pond during the non-growing season will be in compliance with the requirements of IDAPA 58.01.11, *Ground Water Quality Rule*. The assessment must address the current wastewater treatment plant flows as well as future projected flows. If the assessment indicates that the *Ground Water Quality Rule* requirements are not met, the permittee is required to submit a facility plan that explains the measures that the permittee will take to ensure that the facility becomes compliant with the *Ground Water Quality Rule*. The facility plan is required to include a schedule for implementing any necessary actions, which will become an enforceable part of the permit. The compliance condition also indicates that ground water monitoring may be required at the site if deemed necessary based on the results of the assessment. The ground water impact assessment is due within 12 months of permit issuance.

One additional compliance activity has been added to the draft permit, Condition CA-199-03, which requires that the permittee submit a preliminary engineering report (PER) and plans and specifications for providing sufficient storage capacity to store treated effluent during peak day conditions at full build-out of the subdivision. Class B wastewater may only be used to irrigate the driving range during periods that the public will not access the HMU, which will require storage of treated effluent during the day. It appears that the system currently contains sufficient storage capacity in the dosing tank, but additional storage will be required for any additional connections to the wastewater collection system. The storage tank is required to be watertight, constructed of durable materials and not subject to excessive corrosion, decay, frost damage, or cracking. The PER and plans and specifications must be submitted within 18 months of permit issuance, and construction must be completed prior to any additional connections being made to the wastewater collection system.

2.2 Section F - Permit Limits and Conditions

2.2.1 General Information

As discussed previously, the classification of the wastewater has been changed from Class A to Class B municipal wastewater in the draft permit and the allowable irrigation sites were revised to remove residential irrigation and indicate that irrigation is only allowed at the drive range during periods that the public will not access the HMU. The application season was revised to allow discharge to Storage Pond #2 during the non-growing season only. The following paragraphs address the changes to the permit limits and conditions that were done to reflect the new classification and allowed uses. As ground water recharge is generally only allowed for a Class A system, the Class A effluent and monitoring requirements were addressed during the non-growing season to reflect the allowed use.

2.2.2 Wastewater Effluent Requirements and Loading Rate Limits

Dedicated land application sites, such as the driving range, generally have a hydraulic loading rate limit as well as a nitrogen loading rate limit as a condition of the reuse permit to prevent potential degradation of the ground water from over application of certain constituents, such as nitrogen, during the growing season. As discussed in the staff analysis for the previous draft permit, a hydraulic loading rate was not included in the draft permit because of the relatively low flow of effluent as compared to the irrigation water requirement (IWR) for the site. At full build-out, the system is estimated to produce 4,800 gallons/day and the lowest IWR month (October) requires 14,820 gallons per day of irrigation water. The permit also does not include a maximum nitrogen loading rate limit for the growing season at this time; however, a nitrogen loading rate may be added in the future if DEQ determines that one is necessary. A nitrogen loading rate limit was not included based on low

flow rates and correspondingly low nitrogen loading rates. At 4,800 gallons per day and a conservative average nitrogen concentration of 20 mg/L, the total nitrogen application would be approximately 31 pounds per acre per year. The *Southern Idaho Fertilizer Guide* (Mahler, Falen, & Bell, 1998) recommends that 3 to 5 pounds of actual nitrogen be applied per 1,000 square feet of turf each year, which is approximately 131 to 218 pounds of nitrogen per acre per year. Therefore, the amount of nitrogen applied from the treated wastewater is approximately 25% of the total nitrogen required for the turf.

The total nitrogen concentration in the wastewater treatment plant effluent is still required to be less than 10 mg/L during the non-growing season, in accordance with the ground water recharge requirements in the *Recycled Water Rules*.

The turbidity limits have been modified for the growing season to reflect the Class B use and the associated requirements in the *Recycled Water Rules*. During the growing season, the permittee is allowed to have an instantaneous maximum turbidity of 10 Nephelometric Turbidity Unit (NTU) and the 24-hour average shall not exceed 5 NTU. The non-growing season turbidity limits are the same as the original draft permit Class A limits.

The BOD₅ and pH wastewater treatment system effluent limits are requirements for a Class A use only, so the permit has been revised so that they only apply during the non-growing season when the wastewater is discharged to the unlined pond.

2.2.3 Posting, Labeling, and Buffer Zone Requirements

The requirements regarding posting and labeling for new buried and aboveground piping and pumps as well as the reference to the *Recycled Water Rules* for labeling requirements for Class A distribution systems have been removed from the draft permit as the draft permit no longer allows irrigation of common lots or residential irrigation with the treated effluent.

One buffer zone requirement has been added based on the new Class B system classification. The draft permit specifies that the wastewater may not be applied within 100 feet of inhabited dwellings.

2.2.4 Disinfection

The disinfection requirements have been changed to the requirements for a Class B system in the *Recycled Water Rules*. The disinfection system must provide a residual chlorine concentration at the point of compliance of not less than one (1) mg/L total chlorine residual after a contact time of 30 minutes at peak flow. Based on the fact that the public has a low risk of contact with the treated wastewater discharged to the irrigation pond, the Class B disinfection requirements are considered sufficient at this time. Also, both Class A and Class B effluents are required to meet the same level of treatment for total coliform (TC), but the required residual at the end of treatment is different between the two classifications.

2.2.5 Class A Utility User Agreement

The Class A Utility User Agreement and Public Education Program Requirements were removed from the draft permit since the permit no longer allows residential irrigation with the treated wastewater.

2.3 Section G – Monitoring Requirements

Both Class A and Class B classifications require daily monitoring for total coliform, unless otherwise approved by DEQ. Based on the decreased risk of direct human contact with the treated wastewater and relatively small volume of water compared to the IWR and volume of Pond #2 (see Section 4.2 of the staff analysis), the TC monitoring has been reduced to 3 times per week for both the growing season and the non-growing season. The requirement to continuously monitor the total chlorine residual has also been reduced to three times per week to coincide with the TC samples. The rest of the effluent monitoring requirements differ between each application season based on the allowed use.

During the growing season, the draft permit contains a requirement that the permittee monitor for total Kjeldahl nitrogen, nitrate+nitrite-nitrogen, total phosphorous, total dissolved solids (TDS), electrical conductivity (EC) and pH once per month. Monitoring for TDS, EC, and pH have been added during the growing season because each of the constituents have the potential to degrade the soil quality of the site to a point that affects the growth of the turf on the site. Soil monitoring is not currently required in the permit, but may be included in future permits if the TDS, EC and pH levels in the wastewater indicate a potential for degradation of the soil quality.

During the non-growing season, the permittee is required to monitor pH three times per week (again to coincide with the TC sampling), BOD₅ once per week (in accordance with the *Recycled Water Rules* for Class A water), and total Kjeldahl nitrogen, nitrate+nitrite-nitrogen, TDS, and EC twice per month. The requirement to monitor for total nitrogen during the non-growing season was increased from once per month in the current permit to twice per month due to the fact that the wastewater has direct contact with the ground water during this application season and no further treatment is provided through crop uptake. The previous draft permit and the *Recycled Water Rules* require weekly monitoring of total nitrogen for this allowed use, but the monitoring was reduced by half due to the low flow of wastewater in comparison to the volume of the pond. See the previous staff analysis for the design dilution factor. Monitoring for TDS during the non-growing season has been added because the *Ground Water Quality Rule* contains a secondary limit for TDS and the wastewater discharged into the pond has the potential to affect the amount of TDS in the ground water.

3.0. CONCLUSION

The Rivervine Subdivision wastewater treatment plant was constructed and permitted before the current *Recycled Water Rules* were promulgated and before classifications were created for municipal wastewater treatment plant effluents. As such, the facility does not entirely meet the current requirements for the recycled water uses allowed by its current permit. The requirements of the first draft permit attempted to bring the wastewater treatment system into compliance with the current rules, but the permittee did not feel that this was financially feasible for such a small system with so few connections. As such, the system classification and the allowed uses have been modified in the revised draft permit. The modifications to the allowed uses greatly reduce the potential for human exposure to treated wastewater during the growing season, and additional monitoring for certain constituents during the non-growing season provides protection of the ground water. The permittee will also be required to do a ground water impact assessment (e.g. an NP Evaluation) to demonstrate that the Ground Water Quality Rule will be met during the non-growing season. As such, the revised draft permit provides adequate protection of human health and the environment without requiring major modifications to the existing wastewater treatment plant or reuse system.

References

Mahler, R., Falen, C., & Bell, S. (1998, July). *Southern Idaho Fertilizer Guide: Southern Idaho Lawns*. Retrieved November 29, 2011 from University of Idaho College of Agricultural and Life Sciences: <http://www.cals.uidaho.edu/edComm/pdf/CIS/CIS0846.pdf>