

June 1, 2012

MEMORANDUM

TO: Daniel Redline, Regional Administrator
Coeur d'Alene DEQ Regional Office

FROM: John Tindall, P.E., Engineering Manager
Coeur d'Alene DEQ Regional Office

Subject: **Bottle Bay Recreational Water and Sewer District**, Addendum to Reuse Permit LA-000015-04 (Municipal Wastewater), Staff Analysis for Permit Modification

1.0. Purpose

The purpose of this memorandum is to satisfy the requirements of the Idaho *Recycled Water Rules*, IDAPA 58.01.17.400.05 and 58.01.17.700, for issuing a modification to an existing reuse permit. This memorandum addresses the draft, Addendum 'A' to Reuse Permit LA-000015-04, for the municipal treatment and recycled water system owned and operated by the Bottle Bay Recreational Water and Sewer District (BBRWSD).

2.0. Summary of Events

A reuse permit was issued by the Idaho Department of Environmental Quality (DEQ) to BBRWSD (LA-000015-04) on January 29, 2010 and expires January 31, 2015 (DEQ, 2010). A "Staff Analysis" dated December 4, 2009 was prepared to support the renewal of the permit (DEQ, 2009). The current permit authorizes BBRWSD to irrigate a 9.4-acre forested site (see Hydraulic Management Unit, MU-001504 in the 2010 Permit). A permit modification application dated February 23, 2012 was submitted to DEQ requesting that two (2) acres of adjacent forested area owned by BBRWSD be authorized by DEQ for irrigation through a modified reuse permit (T-O Engineers, 2012).

As required by the *Recycled Water Rules*, the draft, modified permit will be presented for a public comment period. After the comment period has closed, DEQ will provide written responses to all relevant comments and prepare a final modified permit for BBRWSD's recycled water system.

3.0. Project Description

The BBRWSD wastewater facilities are described in the 2009 "Staff Analysis" (DEQ, 2009). Four (4) dedicated ground water monitoring wells were constructed in June 2011, as required by compliance activity CA-015-06 in the 2010 Permit (see Figure 1, Site Map).

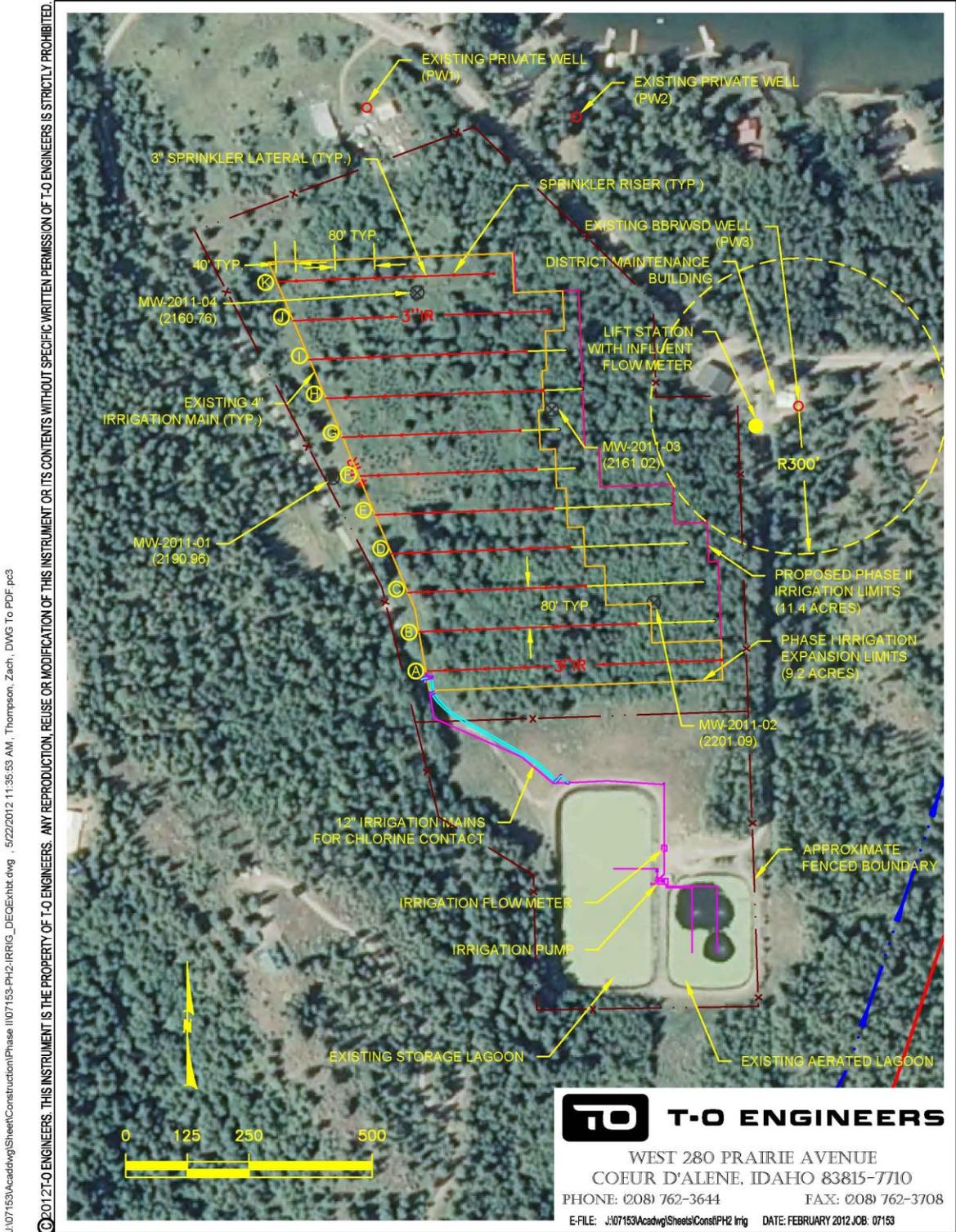


Figure 1, Site Map

The proposed change to the wastewater facilities is an expansion of the existing irrigation system to irrigate an additional two (2) acres of forested property owned by BBRWSD and contiguous with the currently permitted irrigation site. The proposed irrigation system expansion would increase the acreage irrigated in MU-001504 to 11.4 acres.

The proposed irrigation system expansion would change the buffer distance between the irrigation site and the drinking water well at the BBRWSD maintenance building (PW3 on Revised Site Map in Appendix 3) from 500 feet (currently) to 300 feet (proposed). PW3 is monitored annually in October as required in the current reuse permit (GW-001507 is the serial number for this well in the permit). The buffer distance to Lake Pend Oreille will continue to be about 450 feet. Buffer distances to homes and public access areas will remain the same.

4.0. Discussion

A permit modification to expand the irrigation system was contemplated during the renewal of the reuse permit in 2010. The following statement is from Section 4.9 of the 2009 “Staff Analysis”:

The facility proposes an additional expansion of the irrigation area after two years of monitoring the BBRWSD well (PW3). The additional expansion is subject to an additional public comment period and it is recommended that the facility submit a permit modification request for the phase 2 expansion when sufficient water quality data is obtained.

As discussed in Section 4.8 of the 2009 “Staff Analysis”, the buffer distance from the irrigation site to the BBRWSD well at the maintenance building (PW3) was kept at 500 feet when the Permit was issued in 2010 (DEQ, 2009). As required by the 2010 Permit, two (2) samples taken from PW3 in October of 2010 and 2011 show nitrates were non-detect (less than 0.5 mg/L) and chlorides were between 0.53 to 0.60 mg/L (Water Systems MGT, 2011 & 2012). The well is used to provide potable water for the BBRWSD maintenance building and the Sagle Fire District Station #5.

A report by Golder Associates on the hydrogeologic conditions at the BBRWSD irrigation site concluded that there is not adequate information from the drilling of well PW3 to determine which aquifer (unconsolidated deposit aquifer or deeper bedrock aquifer) is supplying the ground water (Golder, 2008). The report discusses that both of these aquifers are confined aquifers but the integrity of the confining layers cannot be determined (Golder, 2008). In a separate report, the shallow ground water flow direction is estimated to be in a northeast direction which places MW3 downgradient from the irrigation site (Monks, 2010).

In 2011, the irrigation system was expanded to cover 9.4 acres, as permitted in the 2010 Reuse Permit (DEQ, 2010). The buffer distance between PW3 and irrigation system changed from about 550 feet to 500 feet in 2011.

The dedicated monitoring wells were constructed in June 2011 so only the September 2011 ground water monitoring sampling event included the new monitoring wells (see Figure 1, Site Map for well locations). The September 2011 ground water monitoring results in the

BBRWSD 2011 Reuse Permit Annual Report, show that in the shallow (10 to 18 feet below ground surface) ground water monitoring wells there were increases in the nitrate and chloride concentrations from upgradient to downgradient (nitrates went from non-detect to a maximum of 2.31 mg/L and chlorides went from 0.54 mg/L to a maximum of 92.6 mg/L) (Water Systems MGT, 2012). There is not enough data to know if this trend will continue or if it is statistically significant. As previously stated, PW3 did not show any change in nitrate or chloride concentrations from 2010 to 2011 (Water Systems MGT, 2011 and 2012).

Using DEQ Guidance (Figure 6-2, "Well Location Acceptability Analysis"), a 300-foot buffer distance between PW3 and the irrigation site is acceptable (DEQ, 2007). This assumes that MW3 is not completed in a hydraulically isolated aquifer. As previously stated, there is not enough information to determine how the well was completed.

Plans and specifications were submitted to DEQ on March 8, 2012 for the irrigation system expansion and approved on May 30, 2012 contingent on the permit modification being signed.

5.0. Conclusions

Based on the 2009 "Staff Analysis" and the DEQ Guidance "Well Acceptability Analysis", it is recommended that the expansion of the irrigation system to within 300 feet from PW3 be permitted. The modified permit will continue to require annual monitoring of PW3. The dedicated monitoring wells are upgradient from PW3 and will provide data on negative impacts to the shallow ground water (10 to 18 feet below the ground surface) from the irrigation of the forested site. The monitoring wells will indicate negative impacts to ground water quality before PW3 would be impacted.

The following are the recommended changes to the 2010 Reuse Permit:

5.1. Loading Rate Related Recommendations

- 1) It is recommended that the permitted irrigation area and hydraulic management unit (MU-001504) be increased by two (2) acres from 9.4 acres to 11.4 acres.
- 2) No changes are recommended from the previous permit for hydraulic and nutrient loading or irrigation season duration.

5.2. Monitoring Related Recommendations

- 1) The completion of the monitoring wells requires a change in the “Ground Water Monitoring” table in Appendix 1, “Environmental Monitoring Serial Numbers” of the 2010 permit. See Figure 1 for the locations of the monitoring wells. The table in the permit will be modified as follows:

2010 Permit Serial Number	2012 Permit Modification Serial Number	2010 Permit Name	2012 Permit Modification Name	Description	Status
GW-001501	GW-001501	MW-8	MW-1	Upgradient Monitoring Well	Active
GW-001502	GW-001502	MW-1	MW-2	Downgradient Monitoring Well	Active
GW-001503	GW-001503	MW-2	MW-3	Downgradient Monitoring Well	Active
GW-001504	GW-001504	MW-5	MW-4	Downgradient Monitoring Well	Active
GW-001505	GW-001505	PW-1	PW-1	Private Well (Hollers)	Active
GW-001506	GW-001506	PW-2	PW-2	private well (Naccarato)	Active
GW-001507	GW-001507	PW-3	PW-3	private well (BBRWSD)	Active
GW-001508	GW-001508	PW-4	PW-4	private well (unconsolidated aquifer and down gradient)	Active

- 2) No other changes are recommended from the previous permit.

5.3. Buffer Zone Recommendations

- 1) It is recommended that the buffer distance between the expanded irrigation site and the BBRWSD maintenance building (PW3 or GW-001507) be reduced from 500 feet to 300 feet based on the DEQ Guidance “Well Acceptability Analysis”, current water quality data from PW3 and the use of dedicated monitoring well upgradient from PW3 to provide early warnings of negative impacts to PW3.
- 2) No changes are recommended from the previous permit to other buffer zone distances.

References

Golder Associates, Inc., June 4, 2008, “Hydrogeological Characterization of the Bottle Bay W&S District Land Application Site”.

Idaho Department of Environmental Quality (DEQ), September 2007. Guidance for the Reclamation and Reuse of Municipal and Industrial Wastewater. Available online at http://www.deq.state.id.us/water/permits_forms/permitting/guidance.cfm.

Idaho Department of Environmental Quality (DEQ), December 9, 2009. “Staff Analysis Memorandum”, Bottle Bay Water and Sewer District, Reuse Permit, LA-000015-04.

Idaho Department of Environmental Quality (DEQ), January 29, 2010. Final Reuse Permit, Bottle Bay Water and Sewer District, LA-000015-04.

Monks Hydro-Geoscience, July 27, 2010, John Monks, P.G. “Bottle Bay Recreational W&S District, Plans and Specification for Wastewater Reuse Site Monitoring Well Network”.

T-O Engineers, February 23, 2012, Scott McNee, P.E. “Bottle Bay Recreational W&S District, Wastewater Reuse Permit Modification (LA-000015-04)”.

Water Systems MGT., INC., January 24, 2011. Bottle Bay Recreation Water and Sewer District, Reuse Permit 2010 Annual Report, Permit No. LA-000015-04.

Water Systems MGT., INC., January 23, 2012. Bottle Bay Recreation Water and Sewer District, Reuse Permit 2011 Annual Report, Permit No. LA-000015-04.