



Recycled Water Reuse Program
Idaho Department of Environmental Quality
Coeur d'Alene Regional Office


Bayview Water and Sewer District
2018 Annual Report Review

Date Completed: January 23, 2019

Completed by: Chris Westerman, EIT

Department of Environmental Quality - Reuse Program

Reuse Permit: Annual Report Review Form

1 Preliminary Information	
1.1 Reviewer	
1.1.1 Name and Title	Chris Westerman, EIT Associate Engineer
1.1.2 Office (Work Station)	<input type="checkbox"/> Technical Services <input type="checkbox"/> BRO <input checked="" type="checkbox"/> CRO <input type="checkbox"/> IFRO <input type="checkbox"/> State Program Office <input type="checkbox"/> LRO <input type="checkbox"/> PRO <input type="checkbox"/> TFRO
1.1.3 Address	2110 Ironwood Parkway Coeur d'Alene, ID 83814
1.1.4 Phone; e-mail	Phone: (208) 666-4611 e-mail: chris.westerman@deq.idaho.gov
1.2 Annual Report	
1.2.1 Document Date:	December 31, 2018
1.2.2 Received Date:	January 2, 2019
1.2.3 Time Period Covered:	Beginning Date: November 1, 2017 End Date: October 31, 2018
1.2.4 Received by Due Date?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments: Received on January 2, 2019
1.3 Date of last Annual Report Review and Reviewer	Date: March 2, 2018 Reviewer Name: Chris Westerman
1.4 Reuse Summary Data: Recycled Water and Constituents applied to reuse site	Recycled Water applied: 4.81 million gallons Nitrogen: 2,162 pounds Phosphorus: NA COD: NA
1.5 Signature of Reviewer and Date	 Date: January 23, 2019

2 Facility Information	
2.1 Permittee Name	Bayview Water and Sewer District
2.2 Permit Number	M-105-04
2.3 Permit Expiration Date	July 1, 2025
2.4 Facility Type	<input checked="" type="checkbox"/> Slow Rate <input type="checkbox"/> Rapid Infiltration <input type="checkbox"/> Overland Flow <input type="checkbox"/> Aquifer Recharge <input type="checkbox"/> Other
2.5 Recycled Water Type	Municipal -> <input type="checkbox"/> Class A <input type="checkbox"/> Class B <input checked="" type="checkbox"/> Class C <input type="checkbox"/> Class D <input type="checkbox"/> Class E Industrial -> <input type="checkbox"/> Potato <input type="checkbox"/> Cheese <input type="checkbox"/> Sugar Beet <input type="checkbox"/> Other:
2.6 Facility Contact Information	
2.6.1 Facility Contact (name and title)	Sharon Meyer, Chairman (See Modification #2)
2.6.2 Address	Bayview Water and Sewer District P.O. Box 637 Bayview, Idaho 83803
2.6.3 Phone and e-mail	Phone: (208) 683-3948 e-mail: bwsd@frontier.com
2.7 Regional Office Jurisdiction	<input type="checkbox"/> BRO <input checked="" type="checkbox"/> CRO <input type="checkbox"/> IFRO <input type="checkbox"/> LRO <input type="checkbox"/> PRO <input type="checkbox"/> TFRO

3 Hydraulic Loading (Recycled Water and Supplemental Irrigation Water)

3.1 Is the land application site hydraulically loaded within permit limits?

Yes
 No
 Not Known
 Not Reviewed
 Not Applicable

Comments: The permittee irrigated nearly 4.81 million gallons (MG) of recycled water during the 2018 irrigation season (Figure 1).

Total recycled water irrigated in millions of gallons from 2010-2018.

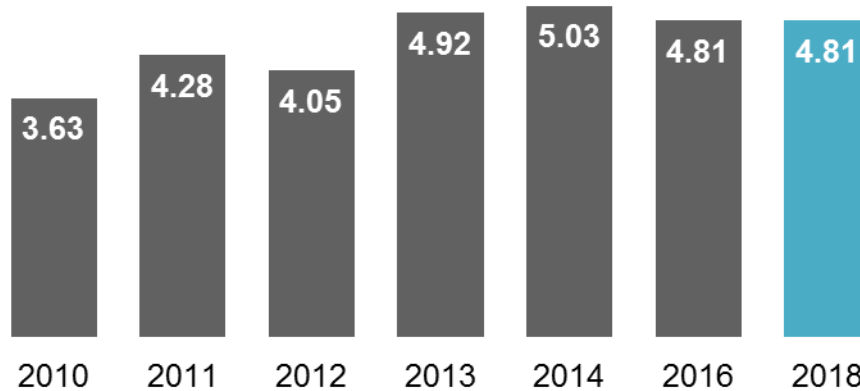


Figure 1 – Recycled water volumes (MG)

3.2 Are hydraulic loading calculations correct?

Yes
 No
 Not Known
 Not Reviewed
 Not Applicable

Comments: Calculations appear to be correct when compared to DEQ staff calculations.

3.3 Are only permitted sites being used for land application?

Yes
 No
 Not Known
 Not Reviewed
 Not Applicable

Comments: The permittee irrigates three (3) management units consisting of approximately 20 acres of a native forested site.

3.4 Is the growing season hydraulic loading substantially at the irrigation water requirement (IWR)?

Yes
 No
 Not Known
 Not Reviewed
 Not Applicable

Comments: Hydraulic loading rates (HLR) for each management unit are substantially at or below the irrigation water requirement (Figure 2-4). This is acceptable for a forested site. Operator records show that each management unit is made up of two or three independent zones. Future annual reports should include the approximate area for each zone for recording purposes.

Hydraulic loading rates in inches for management unit MU-10501 compared to the irrigation water requirement for the 2018 growing season.

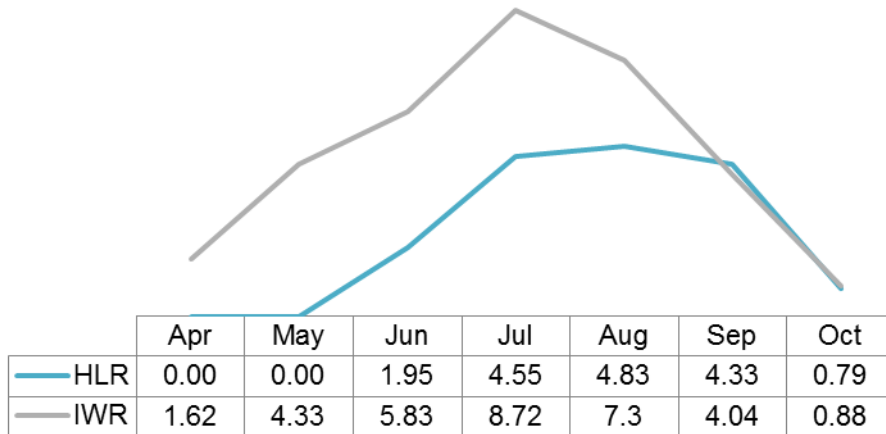


Figure 2 – 2018 HLRs compared to the IWR for MU-010501

Hydraulic loading rates in inches for management unit MU-10502 compared to the irrigation water requirement for the 2018 growing season.

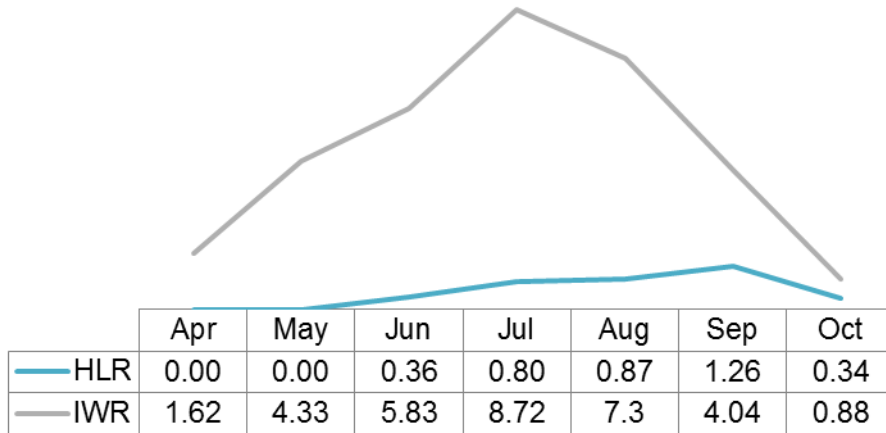


Figure 3 – 2018 HLRs compared to the IWR for MU-10502

Hydraulic loading rates in inches for management unit MU-10503 compared to the irrigation water requirement for the 2018 growing season.

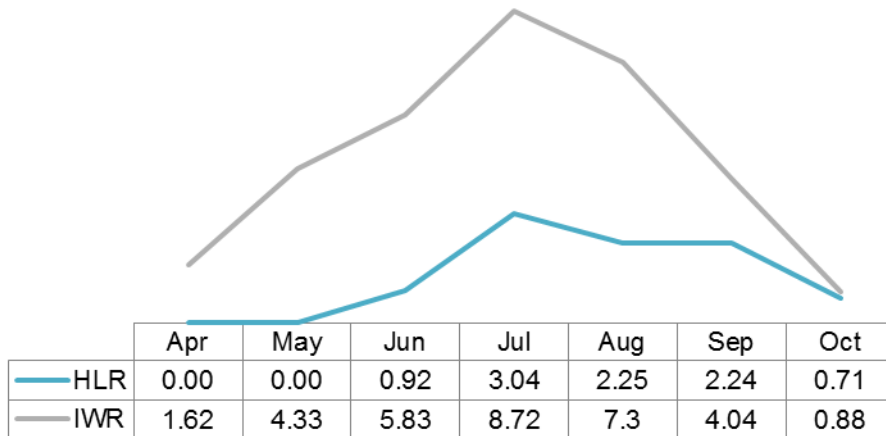


Figure 4 – 2018 HLRs compared to the IWR for MU-10503

3.5 Are non-growing season recycled water loading rates within permitted limits?

Yes
 No
 Not Known
 Not Reviewed
 Not Applicable

Comments: Not applicable; the existing reuse permit does not allow for irrigation during the non-growing season.

4 Nutrient / Constituent Loading and Cropping

4.1 Which nutrients and/or constituents have loading limits in the permit?

Nitrogen Phosphorus COD BOD
 Salt (i.e. NVDS, TDS, TDIS) Other None

Comments: Total nitrogen loading is limited to 144 pounds per acre (lbm/ac) annually for each management unit (Permit M-105-04, Section 4.3, p.11).

4.2 Are nutrients / constituents land applied within limits of the permit?

Yes No Not Known Not Reviewed Not Applicable

Comments: Total nitrogen loading rates for each management unit were less than the total nitrogen limit of 144 lb/ac for the 2018 growing season (Figure 6).

Total nitrogen loading rates (lbm/ac) for each management unit during the 2018 growing season. The data is shown as a running total in each month.

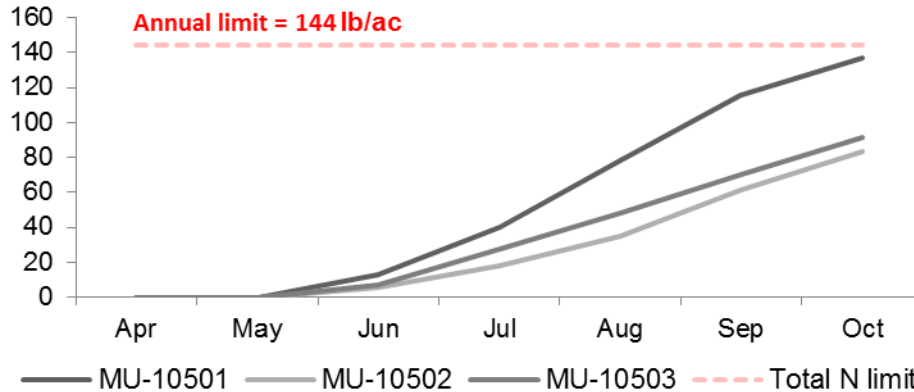


Figure 6 – DEQ total nitrogen loading assessment for the 2018 growing season.

4.3 Are nutrient / constituent loading calculations correct?

Yes No Not Known Not Reviewed Not Applicable

Comments: Calculations appear to be correct when compared to DEQ staff calculations.

4.4 Are crops grown on recycled water land treatment acreage?

Yes No Not Known Not Reviewed Not Applicable

Comments: The permittee irrigates three (3) management units consisting of approximately 20 acres of a native forested site.

4.5 Are crop yields typical for the region?

Yes No Not Known Not Reviewed Not Applicable

Comments: Not applicable; natural forested sites are not expected to produce a typical crop yield.

4.6 Are crop uptake calculations done correctly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	<input type="checkbox"/> Not Reviewed	<input checked="" type="checkbox"/> Not Applicable
Comments: Not applicable.					

5 Monitoring

5.1 Which media are required to be sampled in the permit during this reporting period?	<input type="checkbox"/> Wastewater	<input checked="" type="checkbox"/> Recycled Water	<input checked="" type="checkbox"/> Ground Water	<input type="checkbox"/> Plant Tissue	<input type="checkbox"/> Irrigation Water	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Other
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Comments:

- Ground water monitoring
 - Three (3) on-site piezometers to verify depth to ground water levels (Permit M-105-04, Section 5.2, p.14).
- Recycled water monitoring
 - Monthly total nitrogen (TKN, nitrate as N, and nitrite as N)
 - Weekly total coliform organisms when irrigating occurs (Permit M-105-04, Section 5.1.1, p.14). Total recycled water irrigated to each management is required to be monitored and reported in millions of gallons and inches.
- Soil monitoring
 - Nitrate as N (0-36 inches below ground surface) annually in October (Permit M-105-04, Section 5.3, p.15).
 - Ammonia as N (0-36 inches below ground surface) annually in October (Permit M-105-04, Section 5.3, p.15).

5.2 Ground Water Monitoring

5.2.1 Is the facility reporting monitoring data as required in the permit?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	<input type="checkbox"/> Not Reviewed	<input type="checkbox"/> Not Applicable
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Comments: The reuse permit requires that the permittee monitor the depth to ground water monthly to ensure there is a minimum vertical buffer of 36-inches between the ground surface and the ground water level. Based on the submitted annual report, the permittee indicates all ground water monitoring was completed and the minimum vertical separation to ground water was met.

5.2.2 Are correct analytical methods used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Known	<input type="checkbox"/> Not Reviewed	<input type="checkbox"/> Not Applicable
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Comments: There are three (3) monitoring piezometers located at the reuse site. The permittee uses an electronic water level meter with footage marked for every 1/100th foot (Bayview 2016).

5.2.3 Do monitoring data indicate compliance with permit limits (and Ground Water Quality Rule IDAPA 58.01.11 standards where applicable)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not Known	<input type="checkbox"/> Not Reviewed	<input type="checkbox"/> Not Applicable
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Comments: The permittee is only required to provide measurements to the ground water level demonstrating 36-inches of vertical separation are met (DEQ 2015b).

5.2.4 Has the facility provided analyses/ interpretation of ground water data? If yes, summarize interpretation and/or add DEQ comments below.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: No comment.	
5.3 Recycled Water / Irrigation Water	
5.3.1 Is the facility reporting monitoring data as required in the permit?	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
<p>Comments: There was one instance in which the permittee was not able to determine the number total coliform organisms during the week of June 17th through June 23rd due to laboratory restrictions. It is DEQ's understanding based on the note provided on the June 2018 record sheet Accurate Testing Labs does not accept samples on Thursday or Friday (Hansen 2019).</p> <p>This is acceptable to DEQ with the following comments:</p> <ul style="list-style-type: none"> • Future operator samples should be coordinated with the laboratory prior to submitting. 	
5.3.2 Are correct analytical methods used?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: The analytical methods appear correct based on a review of the standard methods recorded on the laboratory data sheets provided with the annual report submittal.	

<p>5.3.3 Are current recycled water characteristics still as described in permit application materials?</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Known <input type="checkbox"/> Not Reviewed <input type="checkbox"/> Not Applicable
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Comments: DEQ staff compared the constituent concentrations reported in 2018 to the historical data (Figure 7). It should be noted, this data set is not complete at this time.

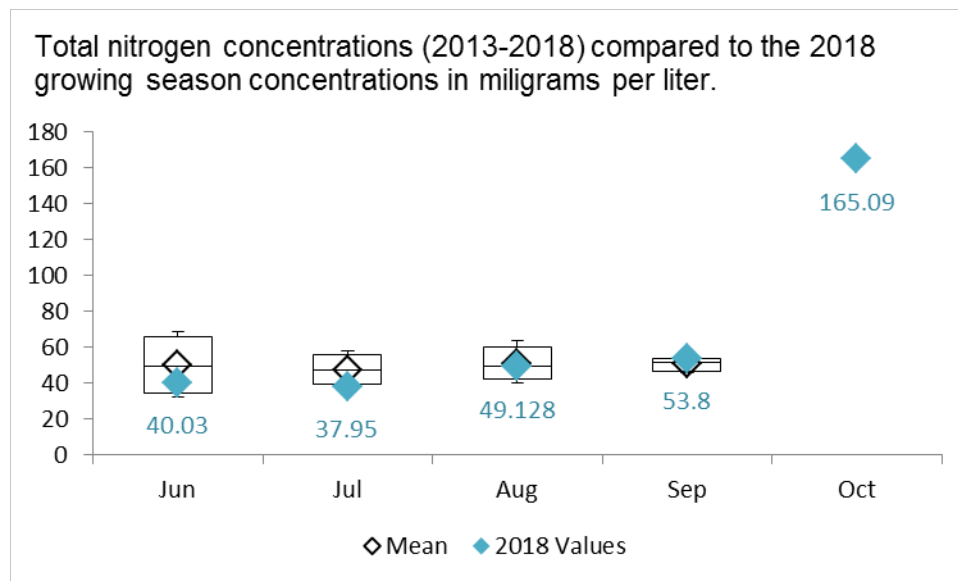


Figure 7 – Typical nitrogen concentrations from 2013-2018 compared to the 2018 values for each month.

<p>5.3.4 Which recycled water constituents have concentration limits in the permit?</p>	<input type="checkbox"/> Nitrogen <input type="checkbox"/> Phosphorus <input type="checkbox"/> Turbidity <input type="checkbox"/> TSS <input checked="" type="checkbox"/> Total Coliform <input type="checkbox"/> Other Microbial <input type="checkbox"/> Other <input type="checkbox"/> None
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Comments: Total coliform is limited to a 5-day median value of 23 total coliform organisms per 100 mL and no single sample can exceed 230 total coliform organisms per 100 mL (Permit M-105-04, Section 5.1.1, p.14).

<p>5.3.5 Are constituent concentrations within limits of the permit?</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Known <input type="checkbox"/> Not Reviewed <input type="checkbox"/> Not Applicable
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Comments: There was one instance where the permittee exceeded the single sample limit of 230 MPN/100mL.

1. August 28, 2018 – single result was >1,600 MPN/100mL.

There were no additional single sample exceedances or any median sample exceedances. DEQ was contacted regarding this exceedance in an e-mail dated August 31, 2018. The District’s operators suspect it has something to do with the chlorine residual being less than 2.0 mg/L, but it is not clear why this occurred. Operators believed this incident was resolved (Hansen 2018b).

<p>5.3.6 Has the facility provided analyses/ interpretation of recycled water/irrigation water data? If yes, summarize interpretation and/or add DEQ comments below.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Known <input type="checkbox"/> Not Reviewed <input type="checkbox"/> Not Applicable
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Comments: No comment.

5.4 Soils	
5.4.1 Is the facility reporting monitoring data as required in the permit?	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Soil samples were taken on November 6, 2018 at each soil management unit for NO ₂ +NO ₃ as N and ammonia as N. As mentioned in the annual report, each management unit subsample was composited into a single depth sample for the site (Hansen 2019). The intent of the permit was to monitor each management unit independently. Future soil sampling must be completed for each depth at each management unit independently. This means the operator should be submitting six (6) soil samples to the laboratory for analysis.	
5.4.2 Are correct analytical methods used?	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: As mentioned above, the operator combined all management unit subsamples into a single composite sample by depth.	
5.4.3 Has the facility provided analyses/ interpretation of soils data? If yes, summarize interpretation and/or add DEQ comments below.	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: The permittee acknowledged the above mentioned error in the 2018 annual report (Hansen 2019).	
5.5 Plant Tissue Monitoring	
5.5.1 Is the facility reporting monitoring data as required in the permit?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; the permittee is not required to monitor plant tissue in the current permit.	
5.5.2 Are correct analytical methods used?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; the permittee is not required to monitor plant tissue in the current permit.	
5.5.3 Has the facility provided analyses/ interpretation of plant tissue data? If yes, summarize interpretation and/or add DEQ comments below.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; the permittee is not required to monitor plant tissue in the current permit.	

5.6 Other Monitoring	
5.6.1 Briefly Describe Other Monitoring Required: The current permit does not include any monitoring requirements in addition to the monitoring requirements described in Section 5.1 above.	
5.6.2 Is the facility reporting monitoring data as required in the permit?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; there is not additional monitoring requirements in the reuse permit.	
5.6.3 Are correct analytical methods used?	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; there is not additional monitoring requirements in the reuse permit.	
5.6.4 Has the facility provided analyses/ interpretation of other monitoring data? If yes, summarize interpretation and/or add DEQ comments below.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: Not applicable; there is not additional monitoring requirements in the reuse permit.	

6 Other Permit Conditions, General Comments, and Recommendations	
6.1 Were acts of noncompliance reported as required by the permit?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable
Comments: There appears to be two noncompliance issues: <ol style="list-style-type: none"> Total coliform exceedance – There was one instance where the number of total coliform organisms reported by the laboratory exceeded the single sample limit (230 MPN/100mL) for a sample taken on August 28, 2018. Soil sampling – The operator appears to have combined the subsamples from each management unit into a single composite sample by depth. The intent of the reuse permit was to have depth composited samples for each soil monitoring unit (i.e. management unit). This issue is acknowledged by the permittee in the 2018 annual report. 	

6.2 Was a compliance activity status update included in the annual report?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable																					
Comments: The 2018 annual report includes the current status of compliance activities.																						
<table border="1"> <thead> <tr> <th data-bbox="181 294 406 327">Compliance Activity</th> <th data-bbox="406 294 805 327">Due Date</th> <th data-bbox="805 294 1347 327">Status</th> </tr> </thead> <tbody> <tr> <td data-bbox="181 327 406 453">CA-105-01</td> <td data-bbox="406 327 805 453">Submit an updated plan of operations (PO)</td> <td data-bbox="805 327 1347 453">January 1, 2016 Approved by DEQ in a letter dated August 12, 2016.</td> </tr> <tr> <td data-bbox="181 453 406 579">CA-105-02</td> <td data-bbox="406 453 805 579">Submit a quality assurance project plan (QAPP)</td> <td data-bbox="805 453 1347 579">January 1, 2016 Approved by DEQ in a letter dated August 12, 2016.</td> </tr> <tr> <td data-bbox="181 579 406 764">CA-105-03</td> <td data-bbox="406 579 805 764">Complete seepage testing on the storage lagoon. Submit a seepage testing procedures to DEQ for review and approval at least 42 days prior to testing.</td> <td data-bbox="805 579 1347 764">June 30, 2019 Pending</td> </tr> <tr> <td data-bbox="181 764 406 827">CA-105-04</td> <td data-bbox="406 764 805 827">Submit an updated Silviculture plan.</td> <td data-bbox="805 764 1347 827">December 31, 2019 Pending</td> </tr> <tr> <td data-bbox="181 827 406 869">CA-105-05</td> <td data-bbox="406 827 805 869">Pre-application workshop</td> <td data-bbox="805 827 1347 869">July 1, 2024 Pending</td> </tr> <tr> <td data-bbox="181 869 406 932">CA-105-06</td> <td data-bbox="406 869 805 932">Submit a permit renewal application</td> <td data-bbox="805 869 1347 932">January 1, 2025 Pending</td> </tr> </tbody> </table>		Compliance Activity	Due Date	Status	CA-105-01	Submit an updated plan of operations (PO)	January 1, 2016 Approved by DEQ in a letter dated August 12, 2016.	CA-105-02	Submit a quality assurance project plan (QAPP)	January 1, 2016 Approved by DEQ in a letter dated August 12, 2016.	CA-105-03	Complete seepage testing on the storage lagoon. Submit a seepage testing procedures to DEQ for review and approval at least 42 days prior to testing.	June 30, 2019 Pending	CA-105-04	Submit an updated Silviculture plan.	December 31, 2019 Pending	CA-105-05	Pre-application workshop	July 1, 2024 Pending	CA-105-06	Submit a permit renewal application	January 1, 2025 Pending
Compliance Activity	Due Date	Status																				
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CA-105-06	Submit a permit renewal application	January 1, 2025 Pending																				
6.3 Were results of backflow testing, repairs, and replacements included?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable																					
Comments: There are no backflow assemblies at the reuse facility. There is one backflow assembly at the tri-plex lift station; it was last tested on October 12, 2017 (Hansen 2018).																						
6.4 Was a discussion of major maintenance activities (major equipment replacement, lagoon liner maintenance, wastewater treatment plant and reuse facility maintenance) included?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable																					
Comments: There were no major maintenance activities during the 2018 growing season (Hansen 2019).																						
6.5 If there are follow-up items from a previous annual report review describe these items and their current status in the Comment Section below.																						
Comments: The 2018 annual report appears to have addressed those items discussed in the 2016 annual report review.																						
6.6 Is the annual report submitted substantially complete?	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Yes No Not Known Not Reviewed Not Applicable																					
Comments: The annual report appears to be substantially complete.																						

6.7 Recommendations

Zone acreage – DEQ is requesting future annual reports include the zone acreage for a better understanding of how irrigation occurs between each zone and how it relates to the hydraulic loading rates reported for each management unit.

Total coliform exceedance – The total coliform single sample result from August 28, 2018 was greater than 1,600 MPN/100mL. The operator contacted DEQ on August 31, 2018 and suspects this was an isolated incident that has been resolved. DEQ agrees with this assessment.

Soil sampling – It appears soil sampling was not completed as required by the reuse permit. The operator composited all soil monitoring units into a single depth sample. The reuse permit requires soil samples are taken for depths of 0-12 inches; 12-24 inches; and 24-36 inches for the three designated soil monitoring units (i.e. management units). Additional details can be reviewed in Reuse Permit M-105-04, Section 5.3, p. 15.

Compliance activity CA-105-03 requires the District to **submit seepage testing results** for the lagoon no later than June 30, 2019. The District will need to submit seepage testing procedures to be reviewed and approved by DEQ at least 42 days prior to the planned seepage test.

Compliance activity CA-105-04 requires the District to submit an **updated Silviculture plan** as prepared by a professional silviculturalist.

6.8 References:

Idaho Department of Environmental Quality. *M-105-04 Bayview Water and Sewer District, Staff Analysis supporting reuse permit issuance* (DEQ 2015a).

Idaho Department of Environmental Quality. Bayview Water and Sewer District Reuse Permit M-105-04. (DEQ 2015b).

Bayview Water and Sewer District. Wastewater Collection, Treatment and Reuse System Operation and Maintenance Manual (Bayview 2016).

Water Systems Management Inc. *2017 Annual Report, Bayview Water and Sewer District*, Permit M-105-04. (Hansen 2018a)

Water Systems Management Inc. *Subject: BAYVIEW WATER & SEWER DISTRICT PERMIT BACTERIA EXCEEDANC*, August 31, 2018. (Hansen 2018b).

Water Systems Management Inc. *2018 Annual Report, Bayview Water and Sewer District*, Permit M-105-04. (Hansen 2019).