



**Sahtu Land and Water Board**

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**July 27, 2020**

**File No. S17L8-003**

Ms. Melissa Fraser  
Environmental Officer  
Contaminated Sites -Transport Canada,  
Prairie and Northern Region  
344 Edmonton St.  
Winnipeg, MB  
R3C 0P6

E-mail: [melissa.fraser@tc.gc.ca](mailto:melissa.fraser@tc.gc.ca)

Dear Ms. Fraser,

The Sahtu Land and Water Board (Board) met on July 27, 2020, to receive the 2019 Annual Water Licence Report, submitted on March 31, 2020.

The Board appreciates the licensee's efforts to submit the Water Licence Report in compliance with the Part B, Condition 11 and Schedule 1, Condition 1 of the Licence S17L8-003. Following are the Board recommendations to improve the future reporting and related follow-up actions.

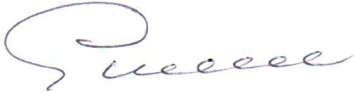
- Use the upgradient well MW1-D as the reference well to draw conclusions and determine action levels based on the same. MW1-D provides better background data as it showed much lower levels of elements of concern compared to MW1; most parameters fall below Federal Interim Groundwater Quality Guideline values.
- Follow the reviewer recommendations (SRRB comment IDs 1, 4, 5, 6) as acknowledged/agreed by you during the public review process.
- User-friendly legends are recommended for the chemistry tables in future reports. The legends should make readers understand the significance of tables and figures without browsing through other pages/documents.

The Board would like to direct the licensee to fulfill the above requirements in subsequent annual reports.

A copy of this letter of direction has been filed on the Public Registry at the SLWB office. Please be advised that this letter is part of the Public Registry and is intended to keep all interested parties informed of how the licence conditions are being met.

The full cooperation of Transport Canada is anticipated and appreciated. If you have any questions or concerns, please contact Aswathy Mary Varghese at (867) 598-2413 ext. 223 or by e-mail at [ash.varghese@slwb.com](mailto:ash.varghese@slwb.com).

Yours Sincerely,

A handwritten signature in black ink, appearing to read "Larry Wallace". The signature is fluid and cursive, with a large initial "L" and "W".

Larry Wallace  
Chair, Sahtu Land and Water Board

**Attachment:** Review Comment Table – 2019 Annual Report (S17L8-003) Public Review

**Copied:** Andrea Jenney, Senior Engineer, BluMetric Environmental, Yellowknife  
Tulita Distribution List  
Erin Goose, Water Resource Officer (Sahtu Region), GNWT-ENR

## REVIEW COMMENT TABLE

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### 2019 Annual Water Licence Report (S17L8-003) (SLWB)

**File(s):** [S17L8-003](#)  
**Proponent:** Transport Canada  
**Reviewer Comments Due By:** May 19, 2020  
**Proponent Responses Due By:** June 9, 2020  
**Documents:** [2019 Annual Water Licence Report](#) 7.5 MB  
**Item For Review Distributed On** Apr 28 at 12:12 [Distribution List](#)

#### Item Description

Transport Canada submitted 2019 Annual Water Licence Report on March 3, 2020. This report is required by Water Licence S17L8-003, Part B, condition 11 and schedule 1.

Although formal approval of this Annual Report is not required under the Licence, the Board must be satisfied that the Licensee has met the requirements of the Licence.

**Using the Online Review System (ORS), reviewers are invited to submit comments and recommendations on the documents linked below by the review comment deadline specified. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the Applicant prior to submitting comments and recommendations.**


#### General Reviewer Information

All documents that have been uploaded to this review are also available on our public Registry. If you have any questions or comments about the ORS or this review, please contact Bonnie Bergsma at (867) 496-2778 or email [bonnie.bergsma@slwb.com](mailto:bonnie.bergsma@slwb.com) or Board staff identified below.

#### Contact Information

Aswathy Varghese 8675982413 Bonnie Bergsma

#### Comment Summary

| GNWT - ENR - EAM (Environmental Assessment and Monitoring): Central Email GNWT |                      |   |  |                                   |
|--|----------------------|---|--|-----------------------------------|
| ID   | Topic                | Reviewer Comment/Recommendation   | Proponent Response   | Board Staff Response              |
| 2  | General File         | <b>Comment</b>  ENR Letter with Comment and Recommendation<br><b>Recommendation</b>  |  |                                   |
| 1  | Topic 1: TSS and COD | <b>Comment</b> Section 3.1.1 indicates that on January 30, 2019, "a deeper well (MW1-D) was drilled directly adjacent to MW1 to ensure that the water table would be screened during both wet and dry conditions so that the upgradient water quality was fully characterized during the annual groundwater monitoring activities." According to Table 8a, concentrations monitored at MW1-D were 396 mg/L on January 31st, 2019 compared to <20 mg/L in August 8th for chemical oxygen demand (COD). As well, levels of total suspended solids (TSS) were 14,500 mg/L in January 31st, compared to 3.6 mg/L in August 8th.<br><b>Recommendation</b> 1) ENR recommends that the Proponent provide a rationale to explain the elevated TSS and COD concentrations monitored in January 2019. | <b>June 9:</b> The January 2019 sampling was conducted immediately after installation and occurred during winter conditions. Utilizing the preferred low-flow sampling method was not feasible due to the potential for water to freeze in the tubing. The January 2019 sample was collected using an inertial footvalve which can be prone to disturbing sediment at the bottom of the well, leading to potentially elevated TSS results. High COD values may occur because of the presence of inorganic substances with which the oxidant can react. The August 8th 2019 and October 13th 2019 sampling events were both successfully completed using low-flow techniques, and both events had low to non-detect results for TSS and COD. This suggests that the elevated TSS and COD results for the January 2019 sampling event are likely a result of the sampling method used. Sampling does not typically occur in winter as part of the monitoring program and low-flow sampling techniques are the preferred method for sampling groundwater at the site. | Proponent response is acceptable. |
| Sahtu Renewable Resource Board: Colin Macdonald                                |                      |   |  |                                   |
| ID   | Topic                | Reviewer Comment/Recommendation   | Proponent Response   | Board Staff Response              |
| 1  | General Report       | <b>Comment</b> (Submitted after Due Date)   |  |                                   |

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|          |               | <p><b>(Submitted after Due Date)</b></p> <p>Overall, the design and management of the closure of the Treatment Facility is reasonable, but the monitoring of groundwater and the interpretation of borehole data are poor. The placement of the monitoring wells is designed to detect contamination from the biopile entering groundwater however elevated metal and hydrocarbon levels in the “background” site (MW1) clearly indicate that using that site for comparison to the downslope wells is inappropriate. The background site was selected due to its location upslope from the facility, but the data from the groundwater needs to validate and confirm its use as a background or reference site, but it clearly doesn’t. This will be discussed further below.</p> <p><b>Recommendation</b></p> <p>Transport Canada and its contractors need to re-evaluate the monitoring program to account for the high levels of contamination in the “background” borehole. The placement of the borehole is based on the idea that being upslope from the treatment facility represents “background” groundwater characteristics, however the elemental and hydrocarbon data indicate contamination, either from another remote source or from the surface. Monitoring at the new borehole (MW1-D) shows a lower level of contamination that may better represent background.</p> <p>An improved approach may be to analyse the soil in the facility for contaminant levels and “markers” of contamination (e.g., specific compounds, ratios of compounds, etc.) that better indicate the presence of contamination related to the HSTF. At present BluMetric concludes that all elevated levels at MW1 are natural, without any supporting evidence.</p> | <p><b>June 9:</b> Acknowledged. No impacted soil remains within the facility. Soil within the LTU was characterized in 2018 as part of reclamation activities (please see the 2018 Annual Water License Report for details) and impacted soil has since been removed from the site. All soil used to regrade the site met requirements outlined in the water licence and soil was approved for use on the site. Post closure groundwater sampling and monitoring will continue as per the approved Final Normal Wells LTU Closure and Reclamation Plan. Groundwater monitoring will continue to occur twice annually until the groundwater quality observed in the downgradient wells meets the groundwater quality criteria or meets the groundwater quality observed in the upgradient monitoring well over two consecutive seasons.</p> | <p>MW1-D is recommended for use as the reference well/site. Proponent response is acceptable.</p> |
| <p>2</p> | <p>Page 2</p> | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b></p> <p>“One characterization soil sample was collected during drilling for soil disposal purposes.”</p> <p>Table 9B indicates that the soil from MW1-D contained F2, F3 and F4 hydrocarbons. The levels were below CCME CSQGs but does the presence of HCs indicate contamination of the surface soils?</p> <p><b>Recommendation</b> Please discuss the significance of the F2, F3, F4 fractions in relation to other soil samples on the site and potential sources of the hydrocarbons.</p>   | <p><b>June 9:</b> The detections of PHC fractions F2, F3 and F4 in the characterization soil sample from the drilling of MW1-D indicates the presence of HCs in area. These results did not exceed applicable regulatory criteria. There are no indications that these low level concentrations of PHCs are impacting groundwater and migrating downgradient of this location. PHCs have not been detected in groundwater in MW1D, MW2, or MW3. Only one PHC detection has been recorded throughout the monitoring program at the site - PHC-F1 in MW1 on June 28, 2018. The result (1.19 mg/L) was below the FIGWQG of 9.9 mg/L. PHCs have not been detected in groundwater from MW1 in all subsequent sampling events. The site is located within an active airport which presents the potential for hydrocarbon contamination.</p>      | <p>Proponent response is acceptable.</p>  |
| <p>3</p> | <p>Page 3</p> | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b> Retention pond water was discharged even though the concentrations of aluminum, arsenic, iron and manganese were above discharge limits. Discharge occurred following permission from the SLWB and ENR (letter appended).</p> <p><b>Recommendation</b> Please provide rationale from ENR as to why discharge is acceptable and the conditions under which the water could be discharged.</p>  | <p><b>June 9:</b> Discharge of the retention pond water was approved by both the SLWB and ENR. Discussion and rationale for this decision are covered in several documents posted to the public registry for the water licence:</p> <ul style="list-style-type: none"> <li>• S17L8-003 - Inspector Approval to Discharge Sump Water - Mar 13, 2019</li> <li>• S17L8-003 - Norman Wells LTU - Sump Water Response -Mar 6, 2019</li> <li>• S17L8-003 - SLWB Letter - Norman Wells LTU - Discharge of Sump Water - Feb 15, 2019</li> <li>• S17L8-003 - Norman Wells LTU - Sump Discharge Meeting Minutes – Jan 17, 2019</li> </ul>  | <p>Proponent response is acceptable.</p>  |

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| 4 | 3.2.3 Groundwater Sampling | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b></p> <p>I've supported the design of the ground water sampling in past years, but the data here indicate that the background, or control, site may not be appropriate. Lead is elevated which usually suggests a fuel source (Figure Pg 11) and F1-BTEX was detected at MW1 in June, 2018. The Water Quality Management section (Page 12) expresses action levels in terms of site MW1, which has been shown now to also have elevated levels of several elements. The new borehole (MW1-D) appears to have a completely different chemistry (Figure Page 11, Table 6A, 6B, 7A, 7B, 8A, 8B) although its adjacent to MW1 and may better represent background.</p> <p>The water chemistry at MW1 should be a baseline for the other sites and contamination from the biopile should be apparent from elevations from the baseline. The high levels of lead at MW1 indicate a contamination source, possibly from the surface.</p> <p><b>Recommendation</b> Given the very low statistical power of the program and the single control sampling point, other lines of evidence should be used to determine whether contamination is being released from the Facility. For example, measurement of the materials, or combination of materials, in the pile for markers of contamination that can be tracked in groundwater. The concentrations of materials at MW1 and other boreholes are relatively low but the current program is not able to detect changes if concentrations begin to increase significantly. This is significant because the groundwater flow is toward the Mackenzie and if contamination of groundwater is occurring it needs to be contained.</p> | <p><b>June 9:</b> Acknowledged. Significant soil characterization programs were conducted at the site in 2017, 2018 and 2019 (see applicable Annual Water Licence Reports for details), which included sampling soil contained within the facility as well as beneath the liner. With respect to lead, the maximum value for lead detected in sub-liner soils was 12.6 mg/kg, well below the SLWB Water Licence S17L8-003 Treated Soil Criteria of 260 mg/kg. Soil quality beneath the liner did not indicate the presence of impacts associated with the soils historically contained within the LTU which suggests that the liner remained intact and functioned as intended to prevent the migration of contaminants from the facility into adjacent soil and groundwater. Lead exceedances in August 2019 at MW1 (0.0011 mg/L) and MW3 (0.0012 mg/L) were only slightly above the FIGWQG of 0.001 mg/L at 1.1x and 1.2x, respectively. Lead has not exceed criteria at MW1, MW1D, MW2, and MW3 during any other sampling event to date. Groundwater monitoring will continue to occur twice annually until the groundwater quality observed in the downgradient wells meets the groundwater quality criteria or meets the groundwater quality observed in the upgradient monitoring well over two consecutive seasons. Additional sampling data will be obtained in 2020 and the trends in metals concentrations will be addressed in more detail in the 2020 annual report.</p> | Proponent response is acceptable.   |
| 5 | Page 9 QA/QC Procedures    | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b> An explanation of relative percentage difference between the sample and a duplicate is provided, but no where in the report is the analysis reported.</p> <p><b>Recommendation</b> Provide an analysis of the duplicate analyses (plural) to support the reported chemical data. Edit the reported data for consistency in the number of significant figures in the appended tables.</p>   | <p><b>June 9:</b> Agreed. Duplicate sample results were presented but the actual calculations were not included. BluMetric will ensure these calculations are included in future submissions. - Your feedback regarding significant figures in the data tables will be taken into consideration for future submissions.</p>  | Proponent response is acceptable.   |
| 6 | Page 12                    | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b> "... MW1 were greater than concentrations found in the downgradient wells, MW2 and MW3. This suggests groundwater quality has not been impacted by the HSTF and no further action is required."</p> <p><b>Recommendation</b> It's hard to agree with this conclusion when the levels of contamination are high in the background site. You would reach a different conclusion if you used MW1-D as the reference site.</p>   | <p><b>June 9:</b> Acknowledged. TC will continue to monitor and sample MW1 and MW1D to further evaluate the groundwater quality, collect additional data and the evaluate the local hydrogeologic conditions based on this data.</p>   | MW1-D (which has much lower levels of elements of concern, compared to MW1; most parameters below FIGWQG values) is recommended for use as the reference well/site. Proponent response is acceptable. |
| 7 | PFOS                       | <p><b>Comment (Submitted after Due Date) (Submitted after Due Date)</b> The proponent analyses groundwater samples for Per- and Polyfluoroalkyl substances, and PFOS and PFOA in soil (presumably to search for compounds associated with fire foam), but these may not be the best compounds to look for, given the large number of fire foam mixtures available.</p> <p><b>Recommendation</b> The proponent should start with the known fire foam mixtures used at the airport and look for traces of them in the biopile. If they are not present in soil, then they will unlikely be in the groundwater. The chemical analysis should be looking for the specific compounds used out of the hundreds of possible compounds.</p>  | <p><b>June 9:</b> Soil characterization programs at the site, both within the LTU and from below the liner were completed in 2017, 2018, and 2019, including a soil sampling program to determine whether PFAS impacted soil was present. All criteria specified in the water licence for water and soil have included the requirement to analyse for PFOS/PFAS. These results have been presented in the 2017 and 2018 Annual Water Licence Reports. PFOS and PFOA parameters are sampled as part of the annual monitoring program in compliance with the water licence requirements. The site characterization phase has been completed and the site is currently undergoing reclamation.</p>  | Proponent response is acceptable.   |
| 8 | Table 6D and 7D            | <p><b>Comment</b> Why report all the perfluoroalkyl</p>  | <p><b>June 9:</b> The reporting of perfluoroalkyl</p>  | Proponent response  |

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|  |  | substances when they were not analysed?<br><b>Recommendation</b> Remove the data that were not analysed (as in Table 8D). | substances not analysed was included in the report in error. This will be noted for future submissions. | is acceptable. |
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