

Diavik Diamond Mines (2012) Inc.  
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Joseph Mackenzie, Chair  
Wek'èezhii Land and Water Board  
PO Box 32  
Wekweètì, NT X1A 3S3  
Canada

20 December 2019

Dear Mr. Mackenzie:

**Subject: DDMI Request for an update to the Surveillance Network Program to Reduce the Sampling Frequency for Coliforms, BOD<sub>5</sub>, and Oil and Grease at the Main Effluent Discharge**

Diavik Diamond Mines (2012) Inc. (DDMI) kindly requests that the Wek'èezhii Land and Water Board (WLWB or Board) update the Surveillance Network Program (SNP) in Annex 1 of the Diavik Mine Water Licence (W2015L2-0001). This requested update to the SNP is for a change to the sampling frequency for Faecal Coliforms, Biological Oxygen Demand (BOD<sub>5</sub>), and Oil and Grease at the main effluent discharge to Lac de Gras (LDG) from once every 7 days, as per the Board's September 23, 2016 Decision<sup>1</sup>, to once in each calendar quarter. Effluent water is sampled for these parameters when Sewage Treatment Plant (STP) effluent is directed to Lac de Gras (either alone or as part of a larger effluent stream).

As described in the approved Water Management Plan<sup>2</sup>, STP effluent may be indirectly sent to LDG through the following pathway: Process Plant to Processed Kimberlite Containment (PKC) Facility to North Inlet (NI) to North Inlet Water Treatment Plant (NIWTP) to LDG. In the course of this transfer process, STP effluent has a residence time in the site water management system of between several weeks to several months and is diluted by a factor of between 125 to 500 times before reaching LDG. Despite the indirect nature of the STP discharge, whenever this complete flow pathway is active (i.e. water is being transferred from the PKC to the NI) DDMI tests for Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease in treated effluent from the NIWTP at the two SNP stations (1645-18 and 1645-18B). The intent of this sampling is to monitor and assess the impact of STP effluent on site treated water/effluent quality for Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease, prior to discharge to LDG. Over the past decade, DDMI has collected and tested in excess of 400

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<sup>1</sup> [Decision from the Wek'èezhii Land and Water Board Meeting of September 23, 2016.](#)

<sup>2</sup> [Diavik Water Management Plan, Version 14.2](#)

water/effluent quality samples for each of Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease at the two SNP stations. Due to the short sample hold times for some of these parameters and the long travel time to get the samples to laboratories for analyses, DDMI personnel typically collect the samples as late as possible on the night shift, usually by 3:30 a.m., to maintain sample quality and to ensure the validity of test results.

To date, test results have shown that the concentrations of these parameters in the NIWTP-treated effluent have been consistently and significantly below the Effluent Quality Criteria (EQC) thresholds (maximum average concentrations and maximum concentration of any grab sample) established for these parameters in the Diavik Water Licence (**see attached figures**). All (100%) of the NIWTP-treated effluent samples tested over the past 10 years had Faecal Coliforms and BOD<sub>5</sub> concentrations below their respective EQC thresholds for both maximum average concentrations (10 CFU/100ml for Faecal Coliforms; 15 mg/L for BOD<sub>5</sub>) and maximum concentration of any grab sample (20 CFU/100ml for Faecal Coliforms; 5 mg/L for BOD<sub>5</sub>). Additionally, over the past 10 years almost all NIWTP-treated effluent samples had Oil and Grease concentrations below 2 mg/L.

DDMI is of the opinion that, from an environmental risk-management perspective and based on the supporting information presented in this submission, there is a rare likelihood of an exceedance of established EQC thresholds for these parameters for samples collected at the points of effluent discharge. Hence, DDMI believes that a quarterly sampling frequency for Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease at the two SNP stations (1645-18 and 1645-18B) would allow for the efficient use of human/other resources and enable continued and effective sampling and monitoring of these parameters prior to the discharge of NIWTP-treated effluent to the external receiving environment. An updated SNP Station 1645-18/18B (Active) sampling table highlighting this request is attached.

DDMI thanks the Board in advance for considering our request. Please do not hesitate to contact the undersigned or Kofi Boa-Antwi (867 447 3001 or [kofi.boa-antwi@riotinto.com](mailto:kofi.boa-antwi@riotinto.com)) if you have any questions related to this submission.

Yours sincerely,



Sean Sinclair  
Principal Advisor, Environment and Closure Readiness

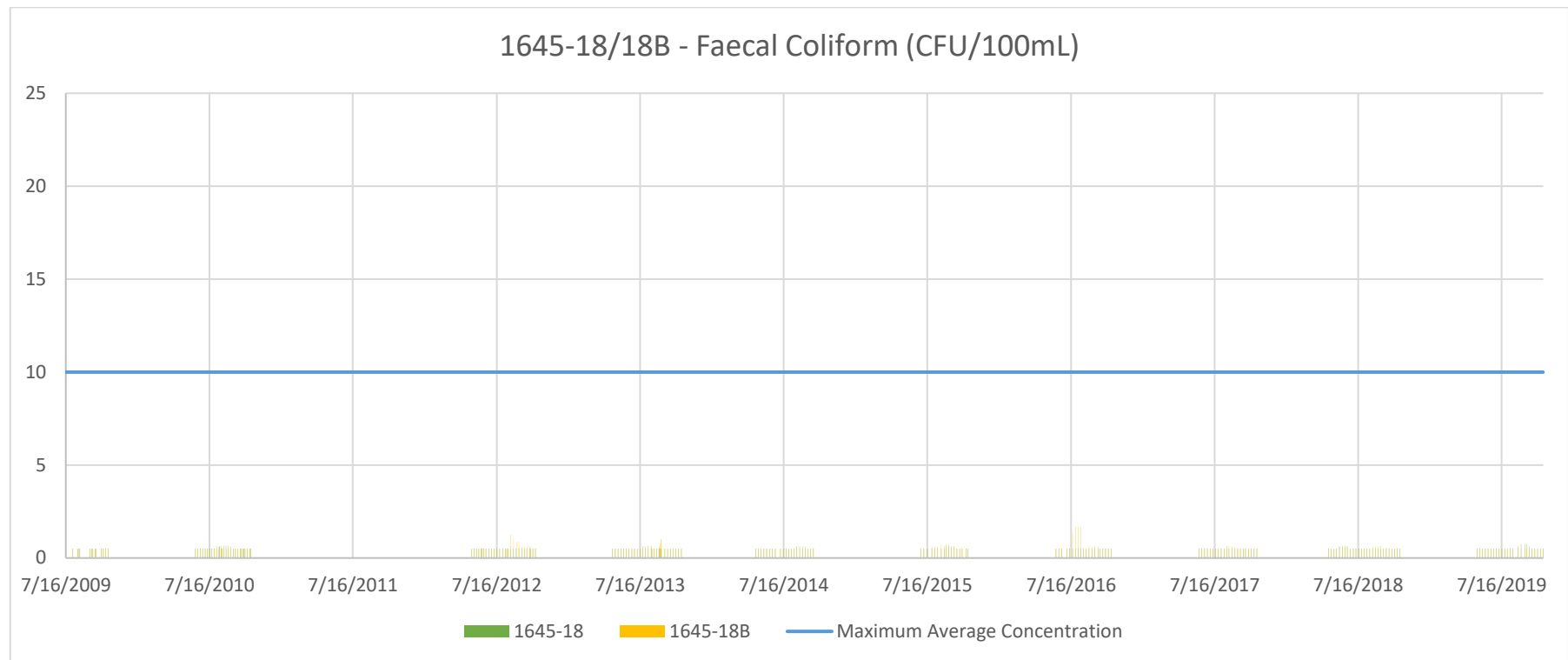
cc: Anneli Jokela, WLWB  
Kassandra DeFrancis, WLWB

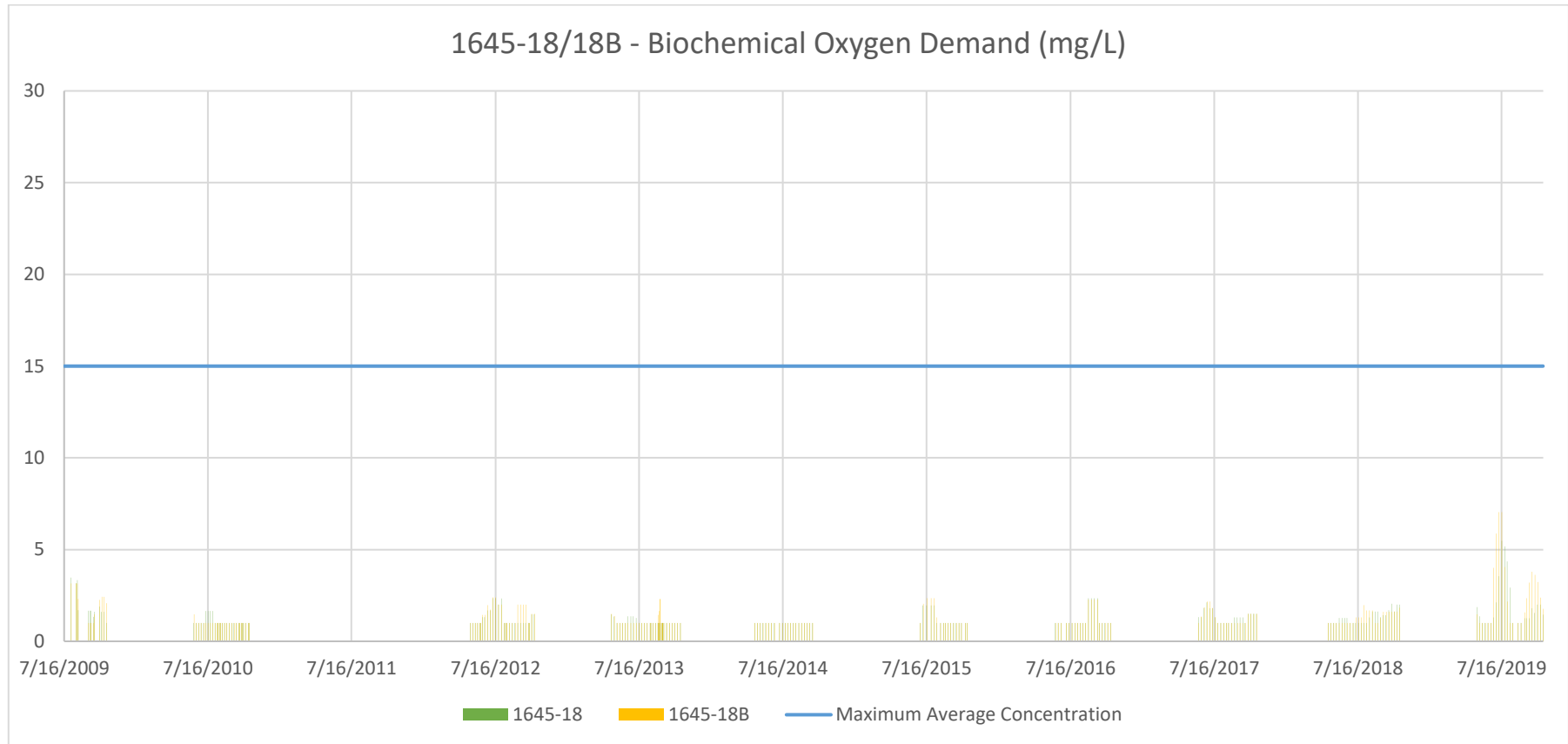
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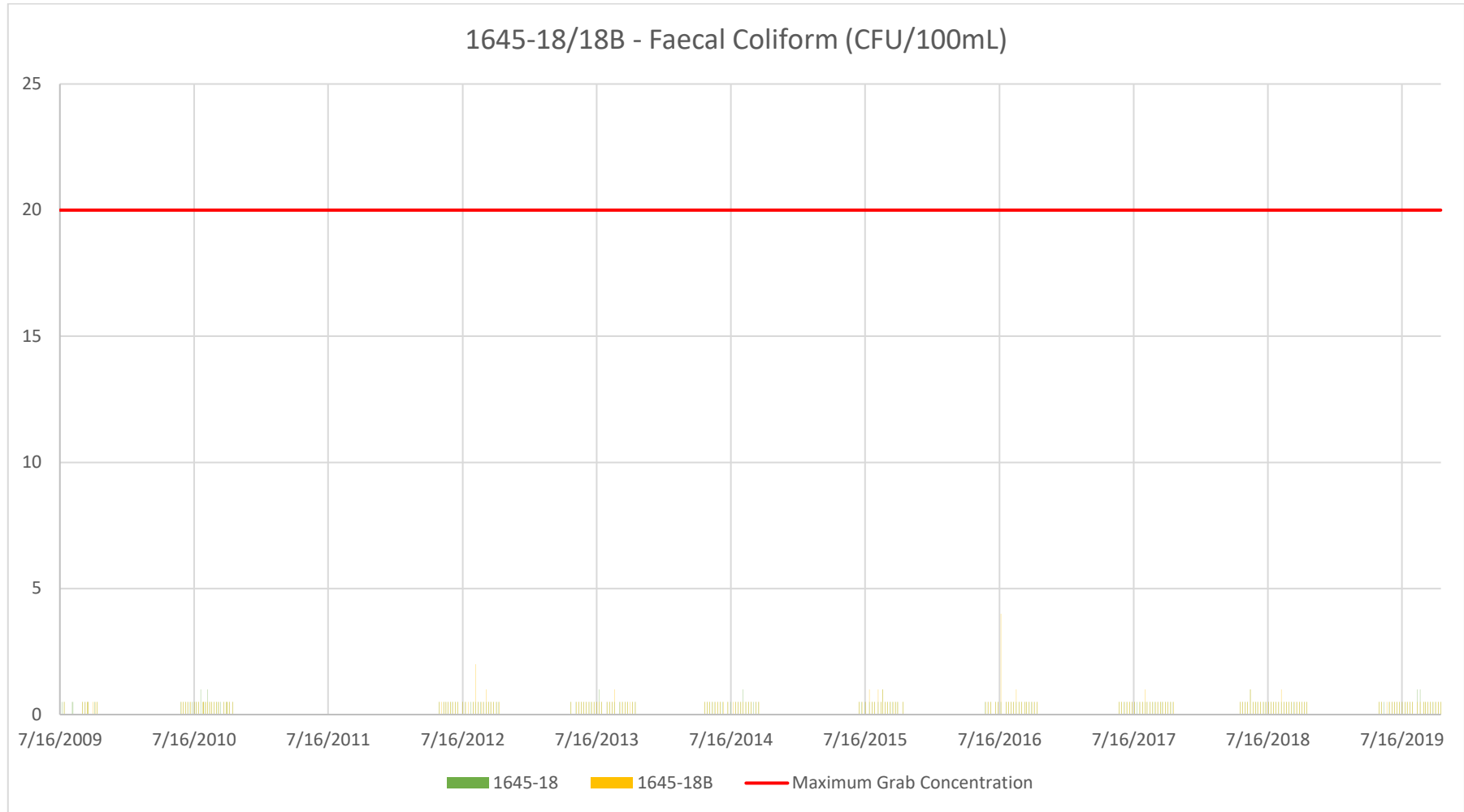
- A comparison of concentrations of Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease in the NIWTP-treated effluent to EQC thresholds in the Diavik Water Licence over the past 10 years.
- Requested revision to SNP Station 1645-18/18B (Active) sampling table.

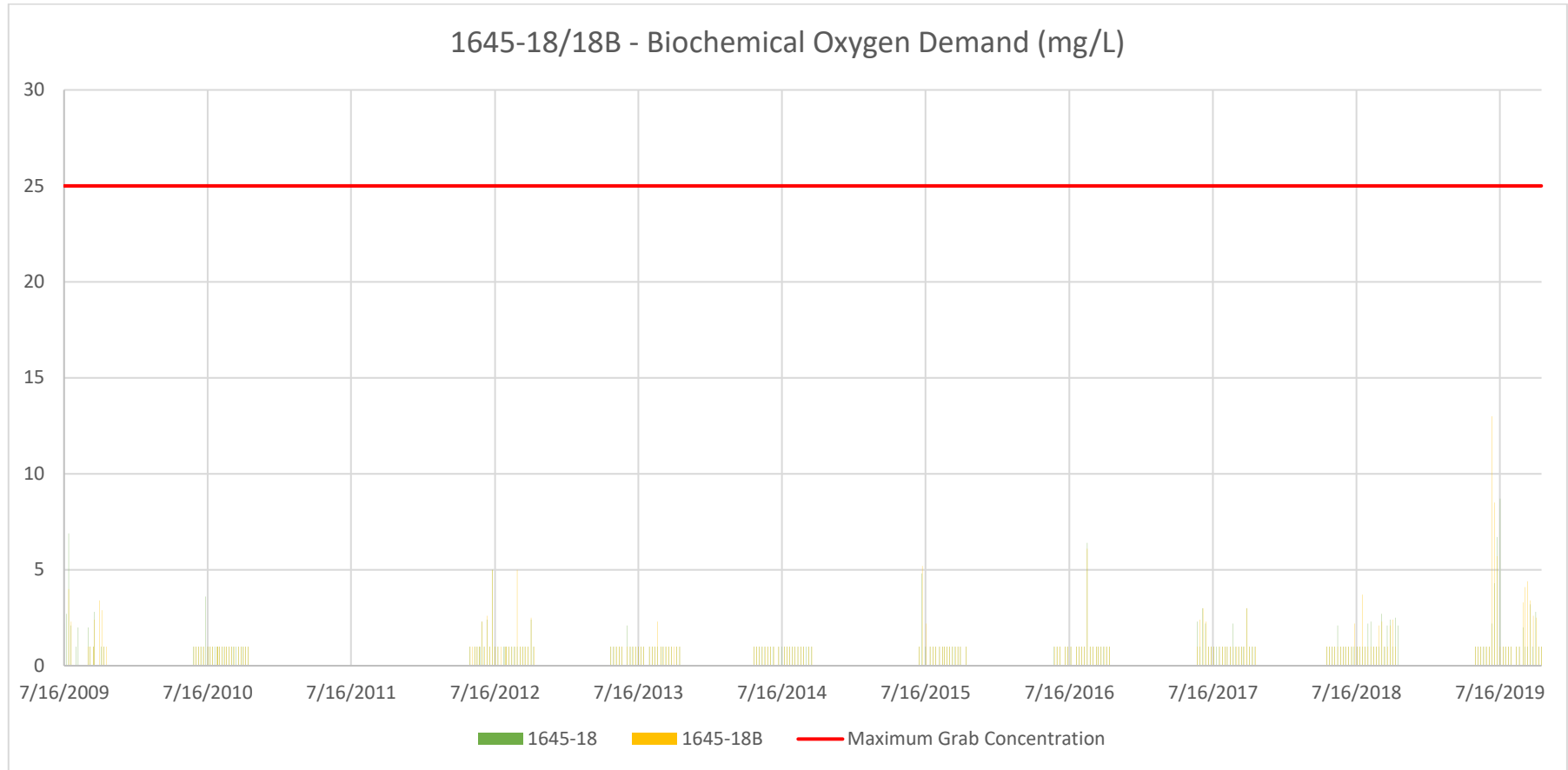
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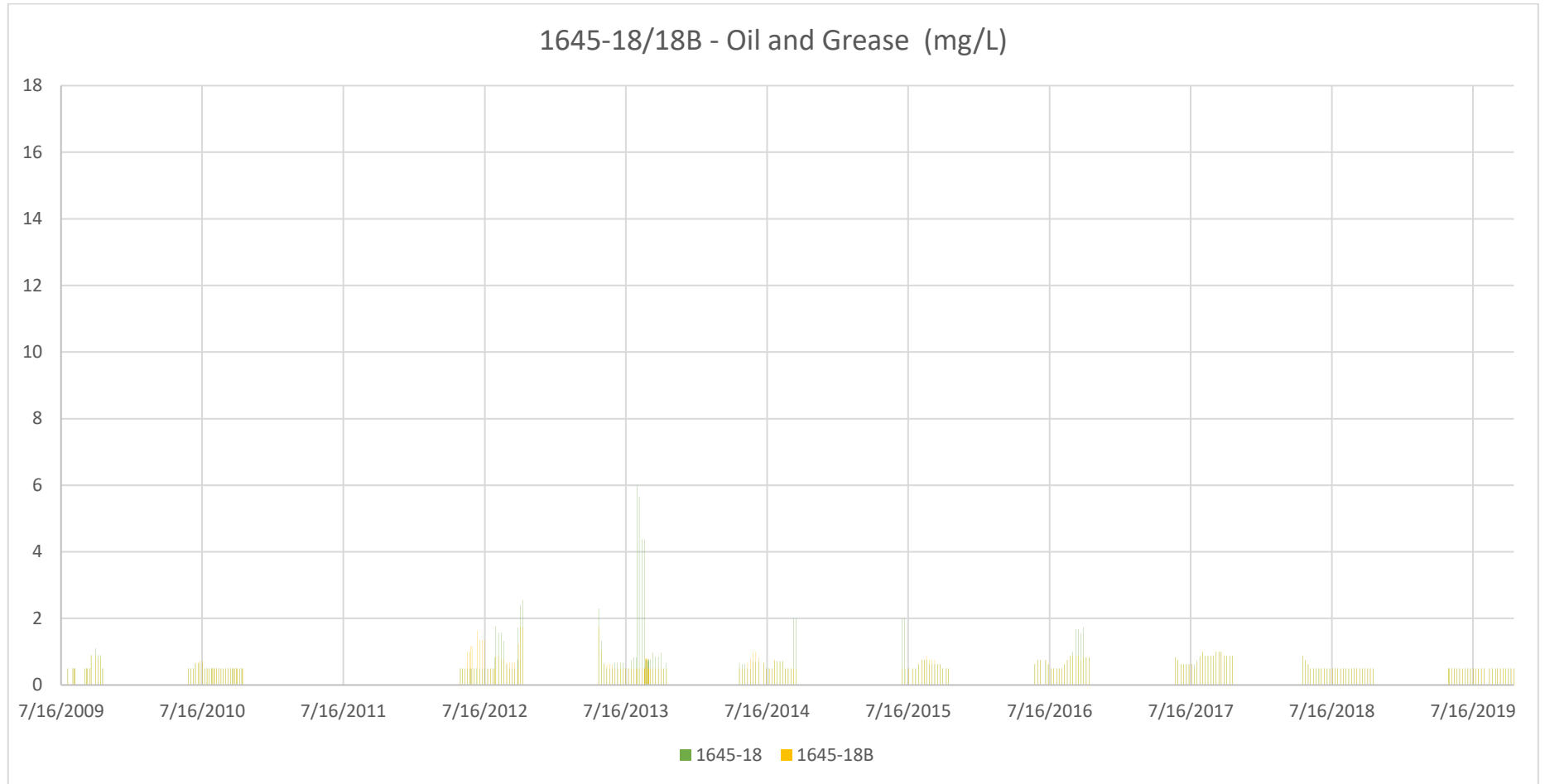
## A comparison of concentrations of Faecal Coliforms, BOD<sub>5</sub>, and Oil and Grease in the NIWTP-treated effluent to EQC thresholds in the Diavik Water Licence over the past 10 years.











### Surveillance Network Program (SNP) Station 1645-18/18B (Active)

Description:	Main effluent Discharge to Lac de Gras from NIWTP (point of compliance)			
Location:	North Inlet Water Treatment Plant 1 – 1645-18 North Inlet Water Treatment Plant 2 – 1645-18B			
Sampling Frequency:	Every six (6) days	Monthly	<u>Quarterly</u>	Quarterly or monthly
Sampling Parameters:	Total Arsenic, Field Parameters <sup>3</sup> , ICP-MS Metal Scan <sup>1</sup> (Total ), Major Ions <sup>2</sup> , pH <sub>4</sub> , Nutrients <sup>5</sup> , Total Mercury, , Total Suspended Solids, Turbidity, Total Petroleum Hydrocarbons <sup>6</sup> (TPH), PHC (F1-F4) <sup>7</sup>	Total Arsenic, Dissolved Organic Carbon, Dissolved Oxygen, Field Parameters <sup>3</sup> , ICP-MS Metal Scan <sup>1</sup> (Total and Dissolved), Major Ions <sup>2</sup> , pH <sub>4</sub> , Nutrients <sup>5</sup> , Total Mercury, Total Organic Carbon, Total Suspended Solids, Turbidity, Total Petroleum Hydrocarbons <sup>6</sup> (TPH), PHC (F1-F4) <sup>7</sup>	Additionally, If effluent from Sewage Treatment Facilities are directed to Lac de Gras... Faecal Coliforms, BOD <sub>5</sub> , Oil and Grease	1. In accordance with Part H, Item 30(a) and (b) <sup>a</sup> 2. Chronic toxicity <sup>b</sup>
Rationale for Station:	This information is required to confirm compliance with EQC, and can also provide information about effectiveness of treatment plant.			