Northern Pulp Nova Scotia Corporation New Glasgow, NS

Focus Report Task 3.2
Effluent Treatment Plant Replacement
Flowrate Data Analysis

Report No.: 11 1112D, rev.2

June, 2019

Focus Report Task 3.2
Effluent Treatment Plant Replacement

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REVISIONS

Revision	Date	Prepared by	Approved	Description
0	June 3, 2019	KF	GRM	Initial issue
1	June 5, 2019	KF	GRM	General revision
2	June 6, 2019	GRM	GRM	Graphic updates

DISTRIBUTION

Revision	Date	Client	KSH	Others
0	June 3, 2019	MW, TF	KF, GRM, DA	
1	June 5, 2019	MW, TF	KF, GRM, DA	
2	June 6, 2019	MW, TF	KF, GRM, DA	

Task 3.2: Effluent Flow

- **Focus Report Task Description**
    - Provide effluent flow data to support the proposed peak treatment capacity of 85,000 m^3 maximum flow of effluent per day. At a minimum, data from 2017 and 2018 is required;
    - Provide flow data for Point A, clarify source of the effluent flow volumes given in the EARD, and provide other relevant data and information to support the proposed treatment system design;
    - If the 85,000 m^3 figure cannot be justified based on historical data, identify water reduction projects, or re-evaluate the treatment system design and update the receiving water study accordingly.

Characterization of Mill Effluent - Flowrate

Mill Effluent Flow

- The Point C Parshall flume is the most reliable measure of mill effluent flow and meets PPER standards for flow measurement:
    - This is the location of NPNS' regulated outfall with ECCC;
- Flow is not measured at Point A, the inlet to the BH ETF:
    - Flow is measured using a doppler-type system at the effluent feed pumps at the mill, but this measurement is for indication purposes only, as its accuracy is not sufficient for either data analysis or regulatory purposes.
- To verify the effluent flow at Point C, an analysis of incoming fresh water usage was undertaken, based on the Middle River flow meter installed in the water supply line to NPNS;
- Effluent flow at Point C is roughly 10% lower than the supply of fresh water, which is consistent and representative of evaporative losses to the atmosphere from a mill employing wet scrubber technology.

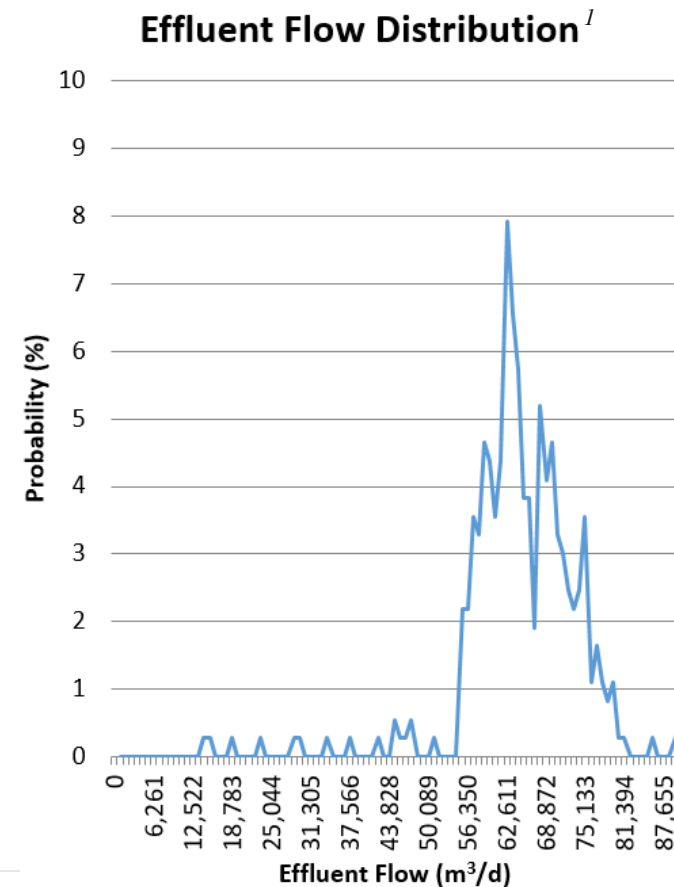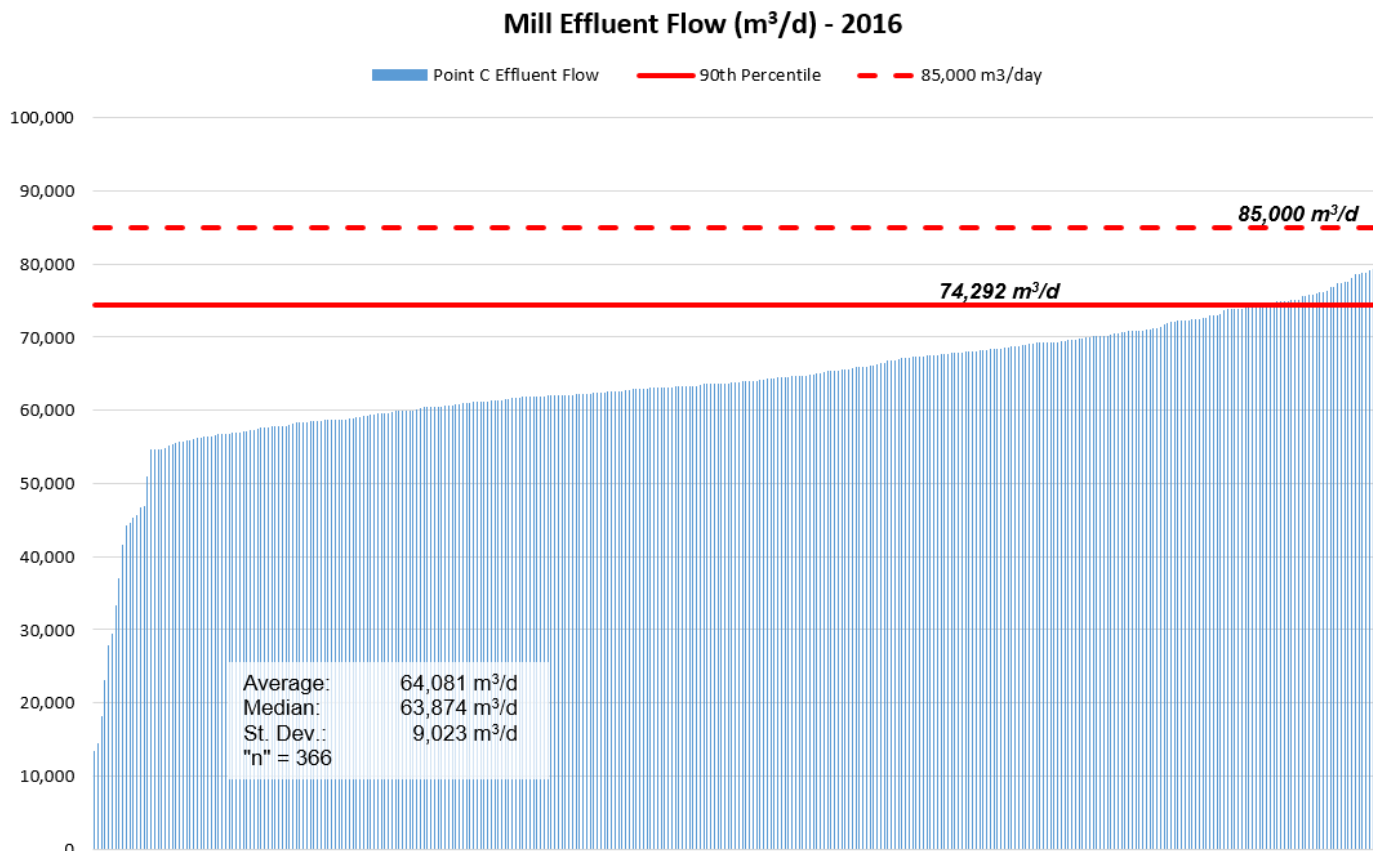# Characterization of Mill Effluent - Flowrate

Data expressed in m³/day

Flow Data Monthly Avg.	IN – Raw Water 2016	OUT – Point C 2016	IN – Raw Water 2017	OUT – Point C 2017	IN – Raw Water 2018	OUT – Point C 2018
January	70,069	64,021	72,837	59,967	69,840	61,136
February	71,331	69,409	73,542	60,431	71,919	63,065
March	68,519	63,438	72,900	62,676	69,270	61,250
April	65,646	60,023	73,122	63,123	69,800	62,768
May	72,487	66,587	73,800	63,338	76,145	67,422
June	74,263	64,781	81,390	67,642	77,600	69,191
July	82,605	72,781	86,230	71,046	84,593	70,083
August	83,097	74,718	85,500	70,388	84,630	70,574
September	65,541	51,556	83,400	69,371	77,320	69,602
October	72,208	64,411	45,201	40,389	58,663	49,329
November	69,072	58,772	74,200	60,879	63,957	59,628
December	69,694	59,002	71,800	61,188	64,429	59,101
AVERAGE	**72,044**	**64,125**	**73,327**	**62,524**	**72,347**	**63,582**

Characterization of Mill Effluent – Flowrate Statistics

Point C Treated Effluent Flow – Stats 2016

- Effluent flow exceeded 85,000 m^3/day on only one day;
- Data shows that over 90% of daily flows will fall below 74,292 m^3/d;
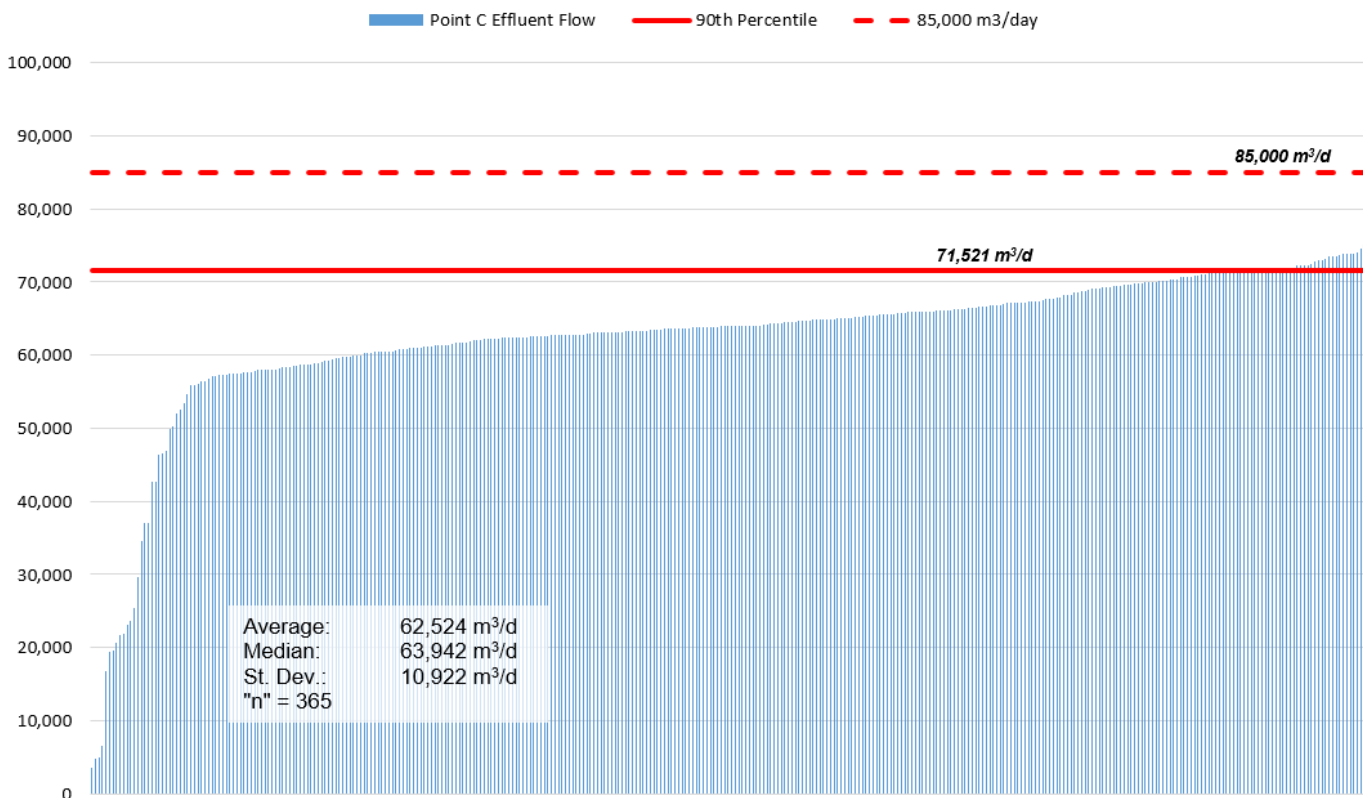- Effluent flow averaged 64,081 m^3/day for the year.

Mill Effluent Flow (m³/d) - 2016

Legend: Point C Effluent Flow | 90th Percentile | 85,000 m3/day

85,000 m³/d

74,292 m³/d

Average: 64,081 m³/d
Median: 63,874 m³/d
St. Dev.: 9,023 m³/d
"n" = 366

[1]: *No production filter applied to data*

Effluent Flow Distribution [1]

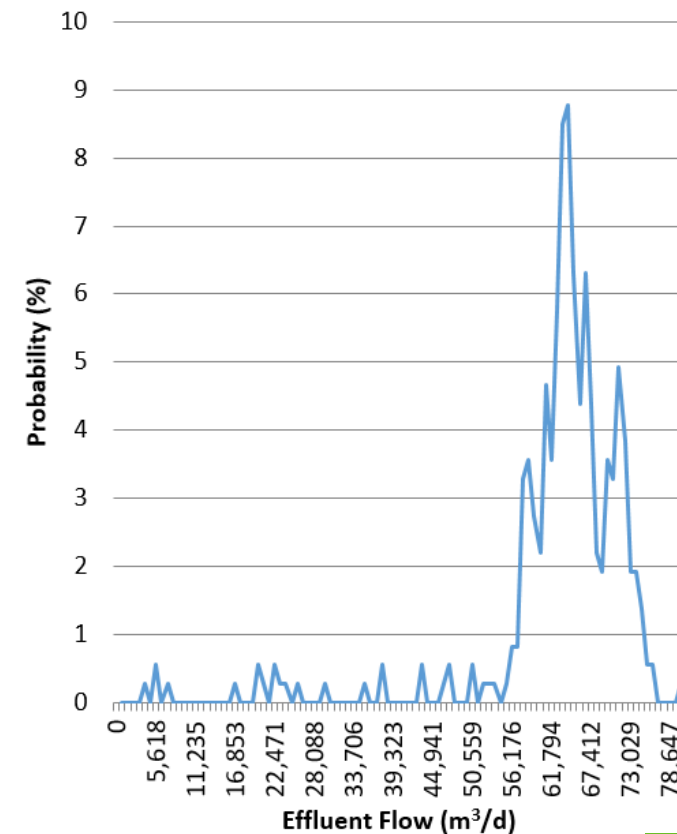# Characterization of Mill Effluent – Flowrate Statistics

Point C Treated Effluent Flow – Stats 2017

- Effluent flow has not exceeded 85,000 m^3/day during the year;
- Data shows that over 90% of daily flows will fall below 71,521 m^3/d;
- Effluent flow averaged 62,524 m^3/day for the year.

Mill Effluent Flow (m³/d) - 2017

Point C Effluent Flow — 90th Percentile — 85,000 m3/day

85,000 m³/d

71,521 m³/d

Average: 62,524 m³/d
Median: 63,942 m³/d
St. Dev.: 10,922 m³/d
"n" = 365

Effluent Flow Distribution [1]

Probability (%)

Effluent Flow (m³/d)

[1]: *No production filter applied to data*

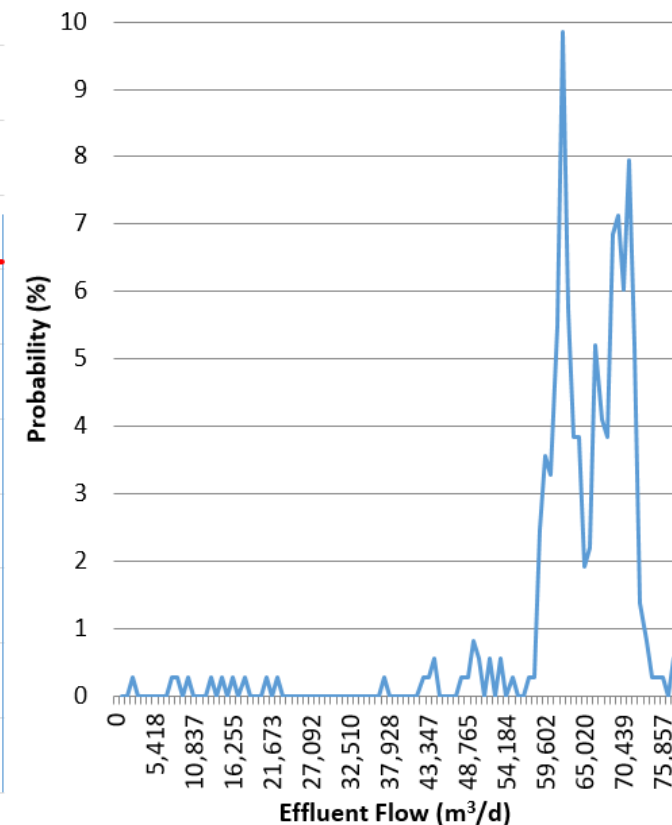# Characterization of Mill Effluent – Flowrate Statistics

Point C Treated Effluent Flow – Stats 2018

- Effluent flow has not exceeded 85,000 m³/day during the year;
- Data shows that over 90% of daily flows will fall below 70,952 m³/d;
- Effluent flow averaged 63,682 m³/day for the year.

Mill Effluent Flow (m³/d) - 2018

Average: 63,582 m³/d
Median: 65,733 m³/d
St. Dev.: 10,282 m³/d
"n" = 365
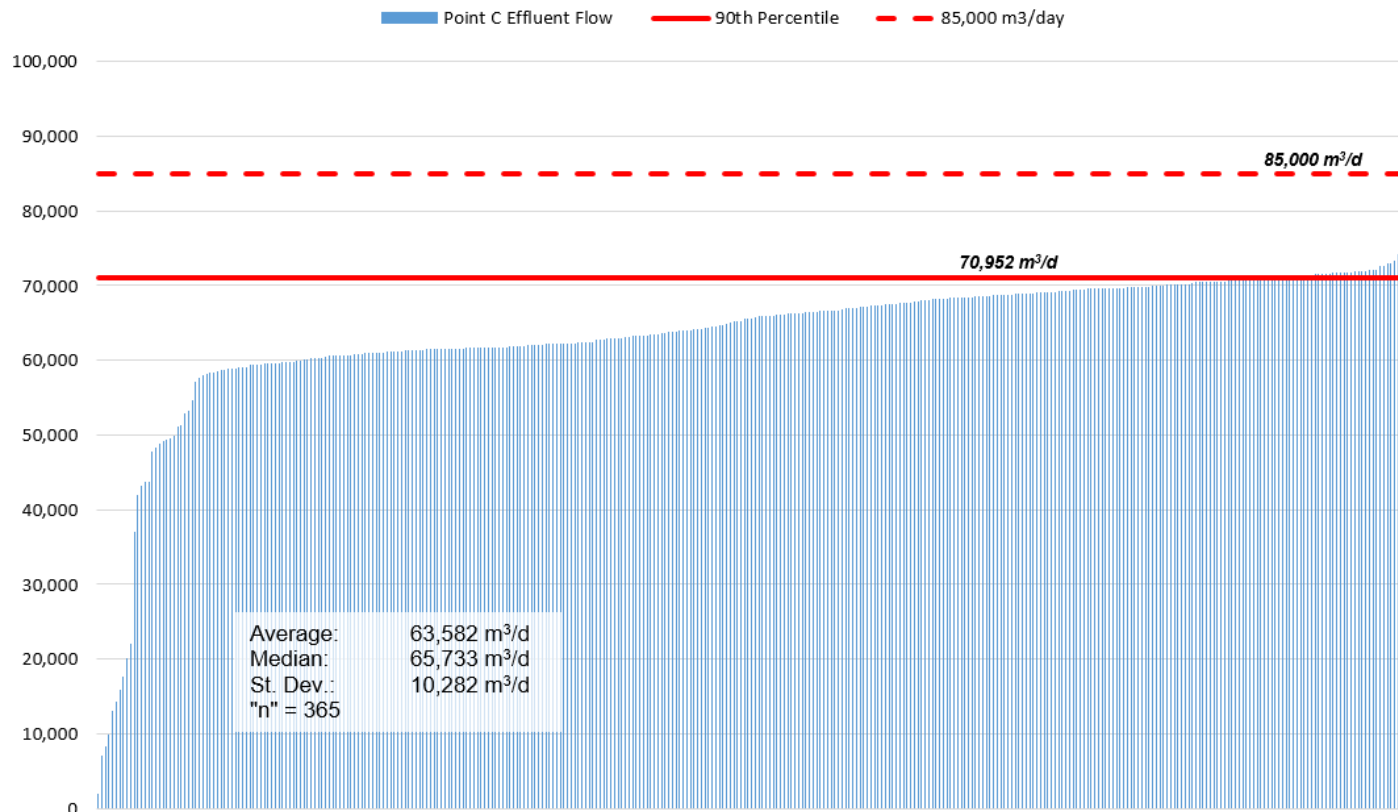
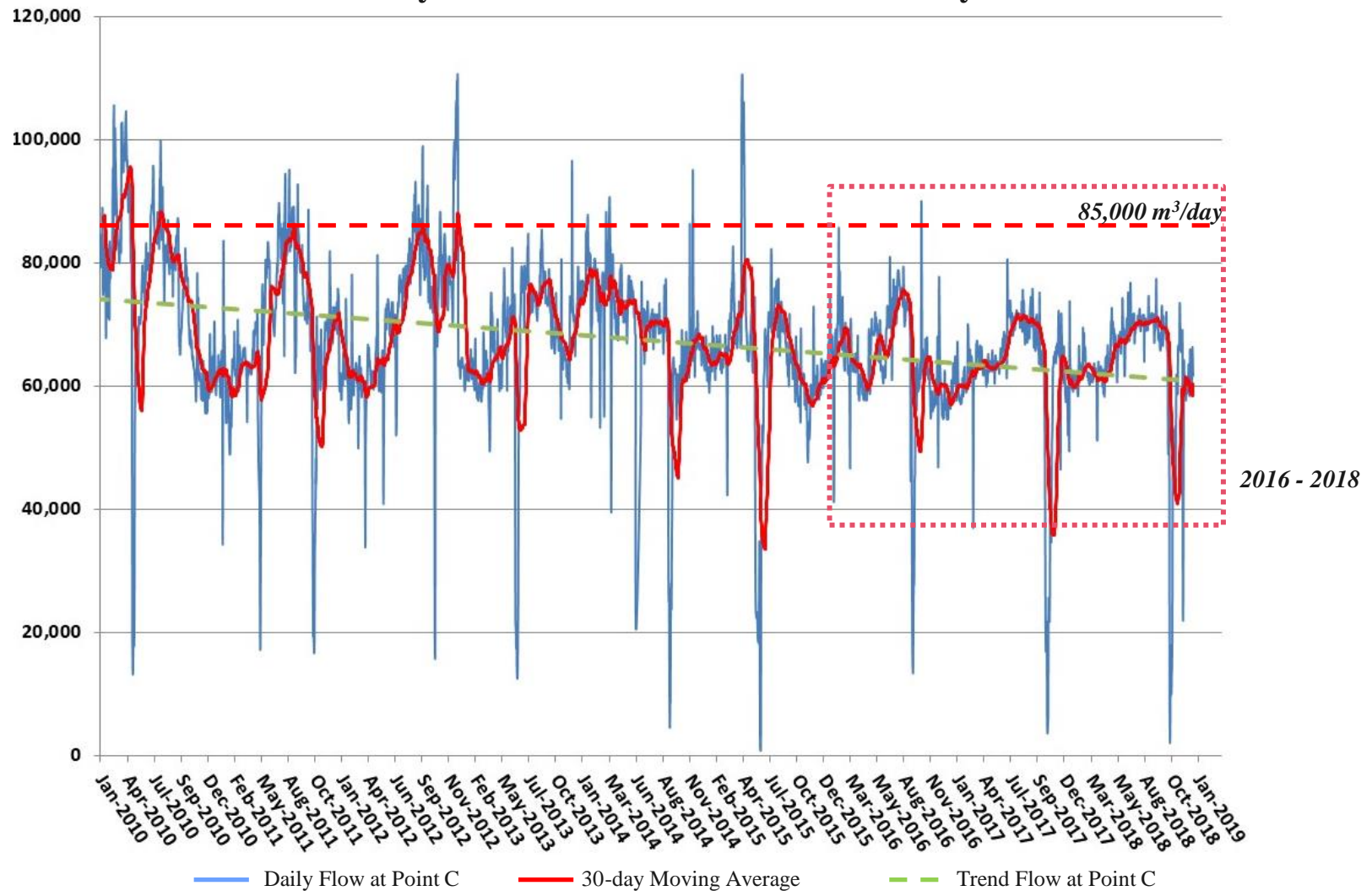Effluent Flow Distribution [1]

[1]: No production filter applied to data

Characterization of Effluent – Flowrate Last 8 Years

Mill Effluent Flow – Point C Flow

- Slight downward trend, one high peak day over 85,000 m³/d in last 3 years.

Daily Flow Recorded at Point C in m³/day

Conclusions

- The mill has strived, over the years, to reduce its water usage and has succeeded;

- Over the last 3 years, the average effluent flow, at Point C, has been 63,466 m³/day;

- Effluent flow exceeded 85,000 m³/day one day in 2016 and not at all in both 2017 and 2018;

- Historical data supports the values used for the effluent treatment plant design, as outlined in Section 4.2.1 of the EARD. These are:

  - 62,000 m³/day average daily flow;

  - 85,000 m³/day peak daily flow.

- The design values chosen for the project were based on present day Point C effluent flow.