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May 22, 2020

Mr. Gord Van Tighem, Chairman
NWT Public Utilities Board
#203-62 Woodland Drive
Box 4211
Hay River, NT X0E 1G1

Dear Mr. Van Tighem,

Re: NTPC 5 Year Capital Plan

Impact of Pandemic

This letter and the attached 5-year capital plan filing were developed based on 2020-21 budgets approved by NTPC's Board of Directors on March 9, 2020 and tabled in the Legislative Assembly on March 16, 2020. Since that time, both the NWT has declared a territorial state of emergency and NTPC has declared a level 3 Emergency. As per NTPC's letter to the PUB dated March 25, 2020, NTPC has made some temporary changes to customer service offices as well as our collection practices. NTPC also suspended the majority of its capital and major operational projects. NTPC is currently reviewing these projects, protocols required by the GNWT as well as NTPC as part of the pandemic response to determine how and to what degree projects may be able to move forward in the near and longer term. In accordance with PUB direction from March 30, 2020, NTPC is tracking the costs and revenue impacts arising from the pandemic for future consideration.

NTPC anticipates that the 5-year capital plan as presented in this paper will differ in terms of timing of delivery and possibly costs for some of the projects identified as a result of the pandemic. As the forecast of this information may take some time and the Board has been waiting for this 5-year capital plan for a number of months, NTPC determined it was appropriate to provide the Board with this information now and will provide updated information at a later date.

Please find attached NTPC's 5-year capital plan filing.

In Board Decision 16-2017 the Board directed the following:

In view of the above the Board considers it important to have greater visibility and transparency of NTPC's capital plans. Accordingly, the Board directs NTPC to file annually, the Corporation's 5-year capital plans, commencing with the 2018/19 filing (for 2019/20 forward), including schedules listing projects and corresponding costs and a narrative description of how the capital plan fits into the Corporation's strategic direction including affordability of rates. The capital plans, required to be filed at the same time as the annual report of finances, would be considered as filings for acknowledgement unless NTPC raises any exceptions requiring the Board's review at the time of filings; the need for continuing to report NTPC's capital plans in this manner will be reviewed for relevance at the time of the next GRA.

NTPC's 20 Year Strategic Plan and Capital Planning Process

The Corporation has developed a Strategic Plan (the Plan) to support NTPC's budgeting and planning processes. The Plan is in alignment with the PUB's concerns raised in Decision 16-2017 and includes building the foundation for a lower carbon future. Although 75% of the electricity generated by NTPC comes from renewable, carbon-free hydro, there is growing demand for renewable generation, such as solar and wind, and alternate technologies to reduce the use of diesel in our thermal Communities. The GNWT's 2030

Energy Strategy and Strategic Climate Change Framework are major parts of the basis for NTPC's Strategic Plan.

Currently, electricity prices in the NWT are approximately five times¹ the Canadian national average. The Plan aims to reduce this gap through a combination of objectives, goals and initiatives. While renewables and lower carbon generation technologies are being integrated, NTPC recognizes that customers must continue to receive affordable and reliable electricity services in their communities. Plans for new renewable projects will be measured against four foundational pillars: reliability, economic sustainability, environmental sustainability and innovation, prior to moving forward. NTPC will be focused on the following seven objectives:

- Reduce fuel consumption
- Reduce controllable costs through efficiencies and continuous improvement
- Invest in core assets
- Increase distribution customer base

- Increase industrial customer base
- Execute Investing in Canada Infrastructure Program projects
- Taltson Expansion and Great Slave Lake Intertie

Initiatives that will support achievement of these objectives have also been developed in support of the Plan. The Plan is a living document that will be updated and revised as events warrant but will remain focused on the ultimate goal: providing sustainable electricity rates and reducing Greenhouse Gas (GHG) emissions.

Investing in core assets and Executing on Investing in Canada Infrastructure Program projects are two objectives of the Plan which are delivered through NTPC's 5-year capital plan as presented. The 5-year capital plan included in this submission is NTPC's expected capital expenditures in a given year. Additions to rate base will happen in the final year of spend as assets are put into service and become used and useful.

¹ Based on Statistics Canada Table 127-0008 Supply and disposition of electrical power: 2017 Residential sales of electricity value in dollars / 2017 Residential sales of electricity in quantity compared against NTPC's 2017 Residential sales of electricity value in dollars / 2017 Residential sales of electricity in quantity

Investing in core assets

As part of NTPC's long term asset management and replacement plan, NTPC continues to build on its draft "Capital Planning and Portfolio Management" document filed as part of NTPC's 2016/19 GRA. NTPC's capital planning process continues to evolve and is currently focused on delivering NTPC's Project Implementation Framework (the Framework). This capital outline identifies expected capital replacement projects based on asset condition assessments, strategic objectives that impact the capital plan as well as factors from NTPC's changing operational environment. A key component of NTPC's development of its capital planning process is a greater emphasis on upfront design and planning in conjunction with a staged approach to project execution, in line with industry best practices. The Framework will address

- Identification of operational needs
- Project classification, business decisions and stage gating
- Detail design, construction and commissioning
- Portfolio planning and management

To support the work on the large capital replacement portfolios NTPC is forecasting to be completed in the next five years, NTPC has an experienced project cost estimator on staff and has hired an estimator, a scheduler and a project controls specialist. These roles will support improved capital project budgets, forecast updates and program delivery.

In NTPC's 5-Year Capital Plan, projects with a lifetime spend less than \$400,000 are grouped together under "Annual spend". The costs and timelines for most of our larger projects are now estimated at an AACE level 4 project cost estimate based on information from August 2019. The support for the timing and costs for the identified projects are currently being reviewed and tested as part of NTPC's capital planning process.

The 2019-20 budget was approved by NTPC's Board of Directors in March 2019 and was updated in the Legislative Assembly on March 16, 2020. As the capital plan evolved through the execution year due to new information, operational challenges and changes as well as vendor information, forecast updates are created and approved by NTPC's Board of Directors.

The 2020-21 capital portfolio budget represents the continuation of multi-year projects started in prior years along with new capital replacements identified through the development of the Framework. The 2020-21 capital budget has been approved by NTPC's Board of Directors in March 2020.

Capital estimates for 2021-22, 2022-23 and 2023-24 are high level estimates of replacement projects required and classified as “annual spend”. Details on these projects outside of the completion of multi-year projects are not provided as these estimates have been reviewed and tested only at a high level and are provided to the Board to give some indication as to expected future capital replacement costs.

Executing on Investing in Canada Infrastructure Program

Over the past year, NTPC, its sister company NT Energy, and the GNWT have secured federal funding approval through the Federal Government’s Investing in Canada Infrastructure Program (ICIP) for several projects that will help the territories reduce its greenhouse gas emissions as well as its dependence on high cost diesel generation. Under this bilateral funding program, approved projects receive 75% funding from the Federal Government with 25% funding being provided by provincial/territorial governments, agencies or Crown Corporations.

For core projects, replacement and refurbishment scope, NTPC will remain the prime contractor and be responsible for project development and commissioning. ICIP will provide funding for 75% of the projects initial estimated cost. The largest projects identified in NTPC’s 5-year capital plan are being delivered under the ICIP. This will reduce the financial burden to NTPC’s customers of extending the operating life of these valuable assets. NTPC’s customers will fund the remaining capital costs for these projects.

Projects currently applied for and approved under this program include: Snare Forks Overhauls of Units 1 & 2, replacement of the Sachs Harbour and Lutsel Ke diesel power plant, installation of a new liquefied natural gas generating plant in Fort Simpson and the Taltson Hydro Generating Unit Overhaul. A description of these projects is provided under Appendix A.

Where the net capital costs of these ICIP projects is greater than the legislated \$5 million, NTPC will submit a project permit application to the Board as required by legislation. The PUB has already approved project permits for the Norman Wells plant replacement and the Snare Forks Unit #1 hydro overhaul project in Decision 16-2017. In its Decision, the PUB directed NTPC to consider renewable integration for the Norman Wells plant replacement². The new power plant is designed to incorporate renewables and this is a new standard for all future NTPC power plant designs. Included in PUB approved rates for 2018-19, was the ½ year cost of the capital addition for the Snare Forks overhaul for

² PUB Decision 16-2017 paragraph 113

Unit 1 only. NTPC is anticipating that insurance proceeds will offset the majority, if not all of the capital costs related to correcting the damage done by the rotor failure in October 2018. The remaining capital cost for the overhaul related work on Unit 1 along with overhaul work on Unit 2 are being financed in part by the ICIP.

To ensure NTPC has the appropriate plan, design and costs to present to the Board and its customers for a major project, NTPC is spending funds in 2019-20 to develop AACE level 4 cost estimates prior to submitting its project permit application to the PUB for the Taltson overhaul portfolio of projects³ currently estimated at a net \$40.6 million over four years. NTPC is expecting the costs of these projects will change as additional engineering work is completed and the scope of individual projects is better defined.

Non-core projects, which will eventually add alternative energy options to NTPC's generation assets, will be undertaken by NT Energy as these projects are new additions to rate base and may include new technology that carries a higher level of risk in construction and development. NT Energy working with the GNWT Department of Infrastructure will manage the procurement, construction and financing of each non-core project. ICIP will provide funding for 75% of the projects initial estimated cost and the GNWT will provide funding for the remaining 25% of the initial estimated cost. Any net balances remaining on these capital projects will be funded by NTPC's customers if a business case can be made that the project will improve rate outcomes for our customers. When the project is completed the ownership of the project will be transferred to NTPC to incorporate into its generation assets. These capital additions will see ICIP funding (included as customer contributions) reducing the rate base impact from the gross plant addition. Currently only the Inuvik High Point Wind Project has been applied for and approved under this program. A description of this project is provided under Appendix B.

Accountability

Given the scale of the capital program there are a number of governance steps in place to ensure accountability for use of the ICIP funds. NTPC, NT Energy and the GNWT have an oversight committee which approves proposed projects and monitors project progress and spending. The ICIP funding is also subject to an annual audit by from the Office of the Auditor General of Canada to assess the prudence of spending and to ensure public accountability and these projects and their expenditures to date are disclosed in NTPC / NT Hydro's annual report.

³ Net cost of \$31.7 million. Rows 30-35 of capital cost less row 68 of ICIP funding

Please feel free to contact me at (867) 874 5200 if you have any questions on this matter.

Respectfully,

A handwritten signature in black ink, appearing to read "Belinda Whitford". The signature is fluid and cursive, with a prominent initial "B" and "W".

Belinda Whitford
Chief Financial Officer

APPENDIX A – NTPC ICIP PROJECTS

Snare Forks Overhauls of Units 1 & 2

ICIP funding was approved in October 2018 to partially offset the overhaul costs of both Units 1 and 2 of the Snare Forks Hydroelectric Facility. The overhaul of Unit 1 was scheduled to begin in April 2019.

In October 2018, Unit 1 experienced a bearing failure. This failure expedited the initiation of this overhaul to 2019-20. Insurance funding is being sought to cover the capital replacement costs associated with the failure as well as the fuel costs associated with this hydro supply not being available. As estimate of offsetting insurance costs have been applied the cost estimates provided in the Approved 2019-20 March Budget and the Approved August Forecast Update in the 5-year capital plan. The capital addition of the Unit 1 overhaul was built into 2018-19 rates as a capital addition. NTPC anticipates that the combined financial impact of the ICIP funding along with the insurance recovery for this overhaul and refurbishment will have a minimal net impact on rates and will significantly extend the life of a main hydro generation source for communities in the North Slave.

Sachs Harbour New Diesel Power Plant Construction

The community of Sachs Harbour is currently powered by diesel power generation with installed capacity of 845 kW. The power plant was originally constructed in 1975, and is past its useful life. The power plant has a fuel efficiency of 3.2 kWh/L which is below NTPC's target plant efficiency of 3.8 kWh/L. An asset condition assessment in 2015 identified a number of plant deficiencies. A replacement plant was determined to be the best option in terms of safety, reliability, fuel efficiency, ground stability, maintenance costs and GHG reductions.

The new power plant and associated equipment will be built and tested in southern Canada then transported to Sachs Harbour by sealift. The old plant will be decommissioned and removed. The new plant will use the existing concrete pad but will be built on a substructure frame to reduce any ground movement issues in the future that may result from the impact of climate change on ground conditions. During construction period mobile generation will be used to meet electrical load. The new plant will be constructed to allow for the future integration of renewable energy components.

Lutsel K'e New Diesel Power Plant Construction

A recent review of the asset health of the Lutsel K'e power plant indicates that this existing power plant has multiple issues that require immediate attention and the entire plant is approaching the end of service life. The power plant has a fuel efficiency of 3.2 kWh/L which is below NTPC's target plant efficiency of 3.8 kWh/L. Consultation with the community indicated a very strong desire to have a new plant capable of integrating

renewable energy options and have it built away from the center of the community to reduce noise, air pollution and the potential for a fuel spill into Great Slave Lake.

The scope of the project is to replace the existing power plant with a new one located at a new site beside the new fuel storage tanks away from the community center. The new power plant and associated equipment will be built and tested in southern Canada then transported to Lutsel K'e by sealift. A feasibility study is being completed in 2019-20 in order to better define the project for the next two years. The scope of the project also includes the purchase of necessary parts, materials and accessories for both the development of the new site of the power plant, the power plant itself and the distribution line to connect the new facility to the community distribution grid.

Design work and procurement of the generation sets will be complete in 2019-20. Procurement for the remaining project will take place in 2020-21 with construction and commissioning completed in 2021-22.

Fort Simpson New Liquefied Natural Gas Generating Plant

The community of Fort Simpson is currently powered by diesel power generation. This project would displace the use of diesel with liquefied natural gas (LNG).

This project would consist of installing gas generation, as well as sufficient LNG storage and regasification for at least one week of generation.

The project has the potential to displace 85% of diesel fuel currently used for power generation in Fort Simpson, representing a reduction of approximately 1.65 million litres of diesel fuel. The resulting reduction in diesel fuel use would mean a reduction of 1,100 tonnes per year in GHG emissions. According to the Center for Liquefied Natural Gas, Natural Gas is considered to be the cleanest burning fossil fuel and the increased use of natural gas (as compared to other fossil fuels) can help to reduce carbon dioxide emissions.

Taltson Hydro Generating Unit Overhaul

The Taltson Hydroelectric facility consists of an 18 MW hydro unit originally constructed in 1965. The entire hydroelectric facility is located at a remote location and therefore also includes a camp, a warehouse, a vehicle garage, road and airstrip. The facility assets, in general, have reached the end of the life cycle and are now due for replacement.

The proposed portfolio of projects would upgrade various hydro, mechanical and electrical components of the Taltson Hydroelectric facility as well as upgrade the road and airstrip and replace the existing camp, substation and pieces of heavy equipment. Support work will also be carried out. In 2019-2020, construction work packages will be developed for the overall project. Design and planning for the overhaul work is expected in 2019-20 along with construction of the winter road and procurement of the camp.

Procurement for the remaining components is targeted for 2020-21 with a view to undertaking and completing construction and commissioning in 2021-22.

APPENDIX B – NT ENERGY ICIP PROJECTS

Inuvik High Point Wind Project

The selection, procurement, delivery and erection of wind generation (up to 4 MW installed capacity) for renewable electricity, a battery storage system for system stability and reliability, and associated infrastructure such as an access road and connecting distribution. The wind project is expected to generate up to 30% of annual total generation and at any given time could be providing in excess of 50% of the instantaneous generation, making it a high penetration project. The diesel reduction potential is up to 3 million litres annually depending on the ultimate configuration, and will reduce Greenhouse Gas Emissions by up to 7,000 tonnes annually.

In order to accommodate the varying generation source of wind, the system will include a large battery system and a grid controller. The grid controller will monitor sources of generation, and if wind falls off faster than a generator can be started, energy will be drawn from the batteries to ensure a reliable electricity system.

This project will also include linear infrastructure elements to connect electrically to the Inuvik grid, as well as provide road access.

**Northwest Territories Power Corporation
5 Year Capital Plan (\$000's)**

Row Number	Project Name	Adjusted 2019-20 Budget	2020-21 Budget	2021-22 Budget	2022-23 Budget	2023-24 Budget
1	Aklavik Block Replacement VSG	-	50	750	-	-
2	Bluefish - Life Extension - Upgrade	-	600	7,986	15,774	15,762
3	Bluefish Camp Upgrade	-	-	500	-	-
4	Bluefish Voltage Conversion	-	-	-	500	500
5	Bluefish Intelligent Monitoring L-200	407	52	-	-	-
6	Deline Switchgear upgrade+genset controls & metering (Design Only)	-	204	700	-	-
7	Fort Liard Replace G1 CAT	-	-	-	-	821
8	Fort Simpson Vehicle 3001 Replacement	-	478	-	-	-
9	Ft Good Hope HMI/Genset/PLC/DC Upgrade	350	587	-	-	-
10	Ft Good Hope Replace G1 CAT	-	65	653	-	-
11	Ft Good Hope Replace G3 CAT	-	-	-	653	-
12	Ft Liard New Fuel Day Tank and Pumping System-Design Only	161	150	700	-	-
13	Ft Simpson New LNG Plant (net of ICIP funding)	22	1,867	2,327	97	-
14	Ft Simpson Replace G4	-	-	-	821	-
15	Ft Smith Voltage Conversion	-	-	-	450	3,500
16	Ft. Smith Substation instrumentation and metering upgrade	563	-	-	-	-
17	Gameti Plant G1 Replacement	-	259	250	-	-
18	Inuvik Tank F upgrades	947	-	-	-	-
19	Inuvik Crankcase Ventilation	-	514	-	-	-
20	Inuvik EMD Plant HVAC upgrade	1,083	25	-	-	-
21	Inuvik Replace lube oil & glycol tank replacement	-	-	500	-	-
22	Jackfish 600V Station Service Upgrade	-	-	150	350	-
23	Jackfish Roof - Building Envelope	600	-	-	-	-
24	Jackfish T5 Reactor Bank/transformer Replacement	569	-	-	-	-
25	Jackfish Fuel Storage Tank Life Extension	-	810	-	-	-
26	Jackfish - Control Replacement	-	202	1,375	-	-
27	Jackfish Office HVAC Upgrade	-	140	360	-	-
28	Jackfish K Plant Overhead Crane Upgrade	-	-	-	-	500
29	Jackfish Modular Gensets	288	66	-	-	-
30	Jackfish Replace Breakers for EMD G5 & G8 and SS Breaker	-	-	-	415	-
31	Jackfish SCADA Scoping & Energy Management	1,492	411	-	-	-
32	Jackfish Vehicle 3010 Replacement	-	478	-	-	-
33	LutselK'e New Power Plant (net of ICIP funding)	125	1,259	1,221	-	-
34	Nahanni Butte Replace G2	603	188	-	-	-
35	Norman Wells Feeder 2 Relocate	230	-	-	580	-
36	Norman Wells Install CAT 3516	-	69	900	-	-
37	Norman Wells New Power Plant	3,433	844	-	-	-
38	Norman Wells Vehicle Replacements	-	-	-	483	-
39	Paulatuk Upgrade Day Tank Fuel Oil Storage System	638	-	201	581	-
40	Sachs Harbour New Power Plant (net of ICIP funding)	618	2,229	1,093	-	-
41	Snare 5B Distribution Line	-	2,170	-	-	-
42	Snare Cascades - Minor Overhaul	-	-	-	200	5,800
43	Snare Falls - Exciter Upgrade	-	-	-	251	725
44	Snare Forks - Unit #G1 Mechanical Overhaul (net of ICIP funding and insurance)	2,127	-	-	-	-
45	Snare Forks - Unit #G2 Mechanical Overhaul (net of ICIP funding)	305	8,440	6,845	-	-
46	Snare L191 Structure Replacements	-	69	512	-	-
47	Snare L193 Structure Replacements	60	579	-	-	-
48	Snare Rapids - Station Service Diesel Genset Upgrade	-	250	250	-	-
49	Snare Rapids Minor Overhaul (G1)	-	-	200	6,000	-
50	Snare Rapids Minor Overhaul (G2)	-	-	200	1,800	-
51	Snare Rapids Penstock Upgrade	-	-	150	650	-
52	Snare Roads : Falls to Forks Road Upgrade	1,100	-	821	-	-
53	Snare - New Camp	-	-	-	-	8,000
54	Snare Falls Substation Rebuild	725	2,370	4,480	-	-
55	Taltson Garage/Warehouse Replacement	-	-	-	4,000	-
56	Taltson L150 Re-Anchoring	-	5,650	4,830	4,590	-
57	Taltson Pine Point - T2 Replacement	-	-	386	580	-
58	Taltson - Camp Replacement	3,700	2,050	-	-	-
59	Taltson - Major Overhaul (net of ICIP funding)	2,073	4,584	16,056	-	-
60	Taltson - Overhaul Heavy Equipment Purchase	720	-	-	-	-
61	Taltson - Tailrace Upgrades	1,110	-	-	2,536	-
62	Taltson Substation Replacement	-	404	3,000	8,000	-
63	Tsiigehtchic Automation upgrade Design & Install	-	200	681	-	-
64	Tsiigehtchic Upgrade Residual Heating System	-	-	-	773	-
65	Tsiigehtchic Office and Transient trailer replacment	-	-	550	-	-
66	Tulita - replace G2	700	1,012	-	-	-
67	Tulita Inside Plant Day Tank Fuel System and Supply Pumping Upgrade	542	-	-	-	-
68	Tulita Replace - G3	-	-	-	-	653
69	Ulukhaktok New staff accommodations	-	509	-	-	-
70	Ulukhaktok New Inside Fuel System	595	-	-	-	-
71	Ulukhaktok Plant Heating Upgrade	704	618	-	-	-
72	Wha Ti - G1 Replacement	-	300	500	-	-
73	Wha Ti - New Power Plant	-	-	-	1,738	5,796
74	Wrigley Genset Installation	603	713	-	-	-
75	Wrigley New Fuel Day Tank and Pumping System	185	622	-	-	-
76	Intelligent Metering Hubs	1,000	1,200	-	-	-
77	Corporate Annual Spend	13,684	13,765	6,120	4,120	4,120
	Grand Total	\$ 42,062	\$ 57,050	\$ 65,247	\$ 55,942	\$ 46,177