

YUKON ENERGY CORPORATION
EXPENDITURES ON PROPERTY, PLANT AND EQUIPMENT ^{2,3}
Projects Included in 2021 Rate Base
(\$000S)

Table 5.2-1
November 2020

Description	Actual 2018 ⁴	Actual 2019	Forecast 2020	Forecast 2021
Major Projects				
Major Projects not in 2017-18 GRA Rate Base				
Breaker Replacement Program	479	1,781	0	0
Mayo to McQuesten Transmission Line Upgrade ¹	0	501	20,000	11,200
McQuesten Substation ¹	123	11,496	0	0
N-1 Capacity Shortage Mobile Genset	227	1,070	0	0
Replace P125 WH2 Head Gate	0	93	2,300	3,500
N-1 Capacity Shortage Thermal Rental Site Electrical Infrastructure	0	0	2,037	0
Transmission Line Refurbishment	0	4,272	0	0
WAF L178	0	0	0	1,300
WH2 Uprate	0	3,044	1,693	7,300
WH4 Uprate [Servomotor]	52	79	400	1,000
Major Projects Reviewed in 2017/18 GRA [forecast not included in 2018 GRA rate base]				
LNG Third Engine / Critical Spares	5,008	97		
Major Projects Reviewed in 2017/18 GRA [forecast included in 2018 GRA rate base]				
MH2 Ten Year Overhaul	1,645			
Breaker Replacement Program - 2018	688			
Transmission Line Refurbishment - 2018	6,280			
Total Major Projects	14,503	22,433	26,430	24,300
Generation				
Dam Safety Program	0	0	0	300
Dam Safety Recommendations 2017/18	110	272	300	0
P126 LNG Boil-off-gas Heat Exchanger	0	194	0	0
Wareham Gate Heater	0	574	100	0
Wareham Gate Refurbishment	0	0	250	0
Whitehorse Diesel System Grounding for Generators	39	218	10	0
WH1 and WH2 Design and Install Dewatering System	0	137	0	0
WH4 Ventilation	0	0	0	750
Other projects under \$100K	891	342	545	60
Total Generation	1,040	1,737	1,205	1,110
Transmission				
Alexco Mobile Substation Connection ¹	0	0	178	0
L177 Re Route	0	0	105	250
Minto Mine Substation - Neutral Ground Resistor ¹	58	105	0	0
Protection and Control Program	0	0	0	300
Transmission Line Access	215	324	300	0
Van Gorda Substation ¹	0	54	199	0
WAF Transmission Upgrades	870	793	0	0
Other projects under \$100K	91	59	256	0
Total Transmission	1,234	1,335	1,038	550

Wareham Gate Refurbishment

2019 Actual	2020 Forecast	2021 Forecast
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\$250,000

The Wareham Dam impounds Wareham Lake and is classified as an extreme hazard Dam.¹ The Wareham Spillway Gates have been in service since 1953 and are critical infrastructure for the Wareham Dam. The spillway gates at Wareham Dam have had significant leakage problems over a number of years, primarily due to age-related wear and corrosion. Recent observations, including an external engineering assessment, indicated that the gates were deteriorating in several ways. Specifically, the skinplates were experiencing pitting corrosion² and needed to be repaired by sandblasting, adding additional plates and plug welding and seal welding the plates in an array to add strength. During testing of the hoist following repairs in 2019, extremely high friction forces were also observed acting on the gate; the wheel bushing was worn; and there was evidence of fretting wear on the wheel paths. Side seals were also leaking at a high rate at times; and copper staunching rod links and retaining clips required refurbishment with new self lubricated bushings to allow them to seal smoothly. Spending in 2020 was focused on undertaking work as identified above to address each of these issues.

As operation of the spillway is a critical part of Mayo Generating Station dam safety, issues with the gates raised reliability and safety concerns. YEC is required to maintain critical infrastructure at the Wareham Dam in accordance with CDA standards; and the existing EPP requires the gates to function at all times.

Whitehorse Diesel System Grounding for Generators

2019 Actual	2020 Forecast	2021 Forecast
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\$218,000 \$10,000

This project prepared grounding calculations and installed acceptable grounding equipment for all Whitehorse diesel generators in order to address the following issues: (1) WD4 and WD5 generators were ungrounded and in the case of a ground fault there was risk of significant damage to this equipment; and (2) the grounding for WD6 and WD7 generators was not identical, and this was an inadequate configuration when several generators were running in parallel.

WH1 and WH2 Design and Install Dewatering System

2019 Actual	2020 Forecast	2021 Forecast
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\$137,000

A suitable system was not in place to automatically control the water levels in the WH1 and WH2 draft tube during dewatering activities. This project installed a redundant and automatic dewatering system integrated with the station PLC to provide visibility and status alarms to increase safety and reduce the risk of a flood in the P125 plant. Prior to implementation of the project, the existing system was oversized, and required large volumes of makeup water to be

¹ The spillway gates are required to stand up to seismic and flood loading and be operational after adverse seismic and flood events. These events are specified in the Canadian Dam Association Guidelines and place a considerable structural demand on the gates.

² The skinplates of the Wareham spillway gates have experienced pitting corrosion which is common for old steel structures submerged in water. The problem may be accelerating because of the additional air introduced to the water by the bubbler system.

5.2-5: OVERHAULS & RESERVE FOR SITE RESTORATION PROJECTS

PP&E spending also includes spending on overhauls, decommissioning and site restoration projects as noted below. There was approximately \$1.173 million in actual spending in 2019 on overhauls and decommissioning projects \$100,000 to \$1 million; no expenditures forecast for 2020; and \$0.580 million forecast for the 2021 test year. Total 2021 rate base increase from these projects approximates \$1.753 million, excluding any depreciation or amortization deductions.

FD7 Overhaul	2019 Actual	2020 Forecast	2021 Forecast
			\$580,000

Faro Diesel #7 (FD7) is located at the Faro Diesel Plant and uses as 12-cylinder Caterpillar Model 3612 diesel engine as its prime mover (vintage 1992). The unit was used when purchased by YEC from a mining operation; however, the complete service history for the unit is not known (YEC has registered 28,624 operating hours). A conditional assessment for the engine was undertaken in 2016 by MPR Associates and a follow-up inspection was undertaken by Finning in May 2016. The inspection focused on items identified in the MPR report and included a more fulsome mechanical inspection that included: removal, measurement and inspection of piston/ rings; inspection of camshaft segments and filter assemblies; measurement of heads and valves and connect rod bearings. One cylinder lining was found cracked and replaced during the inspection. Due to the significant wear found on the inspected parts, it was recommended that a complete overhaul of the unit be undertaken.

Decommissioning on WD3	2019 Actual	2020 Forecast	2021 Forecast
			\$999,000

After removing the third Mirrlees engines from service, all three units were fully decommissioned. Decommissioning included disassembly and removal of all ancillary equipment and piping, asbestos abatement as required, separation and hoisting of major engine components, and backfill and compaction of the engine pits. All decommissioned equipment was removed from site and appropriately disposed of.

Site Restoration Transmission Lines	2019 Actual	2020 Forecast	2021 Forecast
			\$174,000

The Utility maintains a regulatory provision for future removal and site restoration related to property, plant and equipment. Costs of dismantling capital assets, including site remediation, are applied to this account. In 2019, YEC spent \$0.174 million on site remediation relating to the L178 and L355 Transmission Lines.