Exhibit GMP-JRF-1

Green Mountain Power
2017/2018 T&D Plant Additions

Project Title	Project Justification	In-service Date	Plant Addition TOTAL ($)	Plant Addition ($) NON-GROWTH	Function	Criteria	Additional Comments
WO 38 Meters	Capital Blanket expenditures to install new or replace deteriorated or failed meter units in order to serve customers. Meters are also installed to facilitate net metering, customer rate changes and to facilitate substation and circuit monitoring.	**Quarterly, Closing On or Before Dec-17**	**$679,314**	**$405,717**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
WO 37 Regulators and Capacitors	Capital Blanket expenditures to install new or replace deteriorated or failed regulators and capacitor units in order to maintain system capability and reliability. Regulators and capacitors are also installed to improve distribution system efficiency and performance. Proper VAR compensation provides for cost-effective power delivery and is a regulatory requirement for Integrated Resource Plan and ISO Operating Practice 17.	**Quarterly, Closing On or Before Dec-17**	**$981,573**	**$768,866**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
WO 36 Transformers	Capital Blanket expenditures to install new or replace deteriorated and failed transformer units in order to serve customers. Transformer units also have to be replaced as part of voltage conversion projects due to different equipment ratings.	**Quarterly, Closing On or Before Dec-17**	**$3,744,063**	**$1,763,314**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
	Interim Year 2017 Distribution Equipment Purchases		**$5,404,950**	**$2,937,897**			
WO 38 Meters	Capital Blanket expenditures to install new or replace deteriorated or failed meter units in order to serve customers. Meters are also installed to facilitate net metering, customer rate changes and to facilitate substation and circuit monitoring.	**Quarterly, Closing On or Before Dec-18**	**$687,601**	**$410,667**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
WO 37 Regulators and Capacitors	Capital Blanket expenditures to install new or replace deteriorated or failed regulators and capacitor units in order to maintain system capability and reliability. Regulators and capacitors are also installed to improve distribution system efficiency and performance. Proper VAR compensation provides for cost-effective power delivery and is a regulatory requirement for Integrated Resource Plan and ISO Operating Practice 17.	**Quarterly, Closing On or Before Dec-18**	**$993,549**	**$778,247**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
WO 36 Transformers	Capital Blanket expenditures to install new or replace deteriorated and failed transformer units in order to serve customers. Transformer units also have to be replaced as part of voltage conversion projects due to different equipment ratings.	**Quarterly, Closing On or Before Dec-18**	**$3,789,741**	**$1,784,827**	**Distribution/ Purchases**	**Various**	Plant Addition ($) Based on historical 5 year average
	Rate Year 2018 Distribution Equipment Purchases		**$5,470,891**	**$2,973,741**			
Distribution Lines	Capital Blanket WO expenditures for line work and equipment for lines used to supply power at 4.16kV, 8.32kV, 12.47kV, and 34.5kV. Reconstruction projects are non-growth-related and are primarily for improving the safety, efficiency, and reliability of the distribution system. This work includes replacement of obsolete plant, linework associated with telephone, cable and road jobs, work for voltage conversion projects, fuse coordinations and NESC compliance.	**Monthly Closing Jan through Dec-17**	**$26,804,563**	**$21,771,283**	**Distribution/ Lines**	**Various**	Plant Addition ($) Based on historical 5 year average
	Interim Year 2017 Distribution Lines		**$26,804,563**	**$21,771,283**			
Distribution Lines	Capital Blanket WO expenditures for line work and equipment for lines used to supply power at 4.16kV, 8.32kV, 12.47kV, and 34.5kV. Reconstruction projects are non-growth-related and are primarily for improving the safety, efficiency, and reliability of the distribution system. This work includes replacement of obsolete plant, linework associated with telephone, cable and road jobs, work for voltage conversion projects, fuse coordinations and NESC compliance.	**Monthly Closing Jan through Dec-18**	**$27,131,579**	**$22,036,893**	**Distribution/ Lines**	**Various**	Plant Addition ($) Based on historical 5 year average
	Rate Year 2018 Distribution Lines		**$27,131,579**	**$22,036,893**			
143292: Graniteville Wetmore Combo S/S	The Graniteville substation upgrade is necessary to address asset management concerns and National Electrical Safety Code (NESC) compliance concerns to improve safety and reliability. The transformer at the Graniteville #35 substation is a 3 MVA, 34.5 kV to 2.4 kV bank comprised of three individual 1 MVA units that are 90 years old. The existing building located at the Graniteville #35 substation that houses majority of the substation infrastructure has inadequate space and clearance to meet the current NESC code. The transformer at the Wetmore Morse #58 substation is a 1.5 MVA, 34.5 kV to 2.4 kV bank comprised of three individual 500 kVA units. This Project will provide feeder backup between the Graniteville #35 substation feeders and the Websterville #61 substation feeders.	**Aug-17**	**$1,430,338**	**$1,430,338**	**Distribution/ Substation**	**Reliability/Safety**	
143601: Spare Xfmr 5MVA 46-34.5/12.5kV	The purchase of this spare transformer is for reliability in the event that a less than 7MVA 46/12.47 kV or 34.5/12.47 kV transformer fails. GMP currently does not have this size spare in stock. GMP does have numerous spares less than 5 MVA, but they are all over thirty years old and not sufficient to handle necessary loading for many GMP substations. The lead time on the purchase of this size transformer can be 9-12 months.	**May-17**	**$277,107**	**$277,107**	**Distribution/ Substation**	**Reliability**	
153557: Animal Protection - Mobile Sub	The primary reason for this Project is reliability. This Project will enhance reliability with the addition of animal protection on the 34.5/12.47 kV 20 MVA portable transformer. This Mobile transformer is a critical piece of equipment necessary to support and restore service to GMP customers. The mobile unit is installed for planned substation outages or in the event of a transformer failure or an unplanned substation problem. A mobile transformer has a compact design making it more susceptible to an outage with an animal contact. This specific transformer can cover the majority of the Chittenden County for distribution substation transformer issues. The animal protection system to be installed will protect critical assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**May-17**	**$64,397**	**$64,397**	**Distribution/ Substation**	**Reliability**	
148602: Randolph Center Security	The primary reason for this project is Safety. This substation is in a remote location and has had copper theft in the past. The XO bushing lead was cut and removed creating a dangerous situation for customers feed from that sub. Cameras were installed a few years ago and now they need to be augmented with a fence monitoring system. This project is designed to reduce the risk of an unauthorized person from entering the sub and reduce the risk of injury or death to that person.	**Mar-17**	**$33,691**	**$33,691**	**Distribution/ Substation**	**Safety**	
150769: RMAG Test Set	This project is primarily driven by reliability. Higher levels of test equipment are required to maintain critical GMP systems. The two test sets will allow for the testing of vacuum bottles/cables, reclosers, oil filled equipment, including transformers and breakers. Proper testing can allow for proactive solutions, rather than reactive. A failure of a piece of substation equipment will likely result in loss of customer load.	**Jan-17**	**$122,634**	**$122,634**	**Distribution/ Substation**	**Reliability**	
150843: Cellcorder Battery Tester	This project is primarily driven by reliability. This piece of equipment allows for enhanced testing of station batteries. A failure of station batteries can result in loss of power supply for critical loads such as relay protection, switchgear controls, or protective device tripping/closing. Failure could result in the inability of a piece of equipment to operate in the event of a system fault, which could result in damage or destruction of equipment within the substation as well as nonselective fault clearing.	**Jan-17**	**$21,769**	**$21,769**	**Distribution/ Substation**	**Reliability**	
Work Order 34 Minor Additions and Installs	Capital Blanket expenditures to replace or repair deteriorated or failed equipment in distribution substations in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, the replacement of substation equipment such as lightning arresters, batteries, breakers and regulators. These upgrades are not growth related.	**Monthly Closing Jan through Dec-17**	**$751,444**	**$751,444**	**Distribution/ Substation**	**Various**	Plant Addition ($) Based on historical 5 year average
	Interim Year 2017 Distribution Substations		**$2,701,380**	**$2,701,380**			

143591: South Brattleboro RBLD	The primary reason for completing this Project is Reliability. The project provides greater area operating flexibility for feeder backup during planned and emergency outages. Presently the South Brattleboro Substation is home to two transformers: (i) a 3.75/4.687 MVA, 69 kV to 12.47 kV transformer that feeds two circuits; and (ii) a 10/14 MVA, 69 kV to 12.47 kV transformer that feeds two circuits. The 4.687 MVA unit is 54 years old and has limited capacity for feeder backup. The 14 MVA transformer is 27 years old and is also limited in its ability to provide feeder backup to area substations. The upgrades to the South Brattleboro substation would be comprised of one new 15/28 MVA, 69 kV to 12.47 kV transformer, oil containment, a 69 kV high-side circuit breaker and associated fence, ground grid, communications and security. In addition, there would be three distribution circuits with associated circuit breakers and 437 amp regulators. Larger regulators would be installed to allow for greater flexibility with circuit ties during planned outages and contingencies.	**Feb-18**	**$2,777,395**	**$2,777,395**	**Distribution/ Substation**	**Reliability**	
143595: Barre North End	This substation rebuild is being done to improve reliability in the Barre area, and to fulfill GMP's obligations under a PSB order in Docket 8069. In this Order, it requires GMP to conduct a study examining the possible relocation of the Barre South End Substation as well as plan to convert the entire Barre area to 12.47 kV. As part of this plan GMP engaged in an area study, and this project was identified. The Barre area is presently served by three substations: the Barre North End substation; the Barre South End substation; and the Websterville substation. (A fourth area substation, the Barre substation, was removed from service in 2014.) These substations have asset management concerns impacting the reliability of equipment. Each of these substations is supplied from the 34.5 kV subtransmission system and in turn supply, in varying amounts, distribution circuits at voltages of 2.4 kV, 4.16 kV, and 12.47 kV. The rebuild of the Barre #63 North End Substation will provide a strong 12.47 kV source for the area. The substation will be designed with a 15 MVA transformer and three circuits to allow for complete feeder backup for the Barre #37 South End substation, and will significantly improve reliability for local residents and businesses.	**Jun-18**	**$2,462,953**	**$2,462,953**	**Distribution/ Substation**	**Reliability/Regulatory**	
148607: South Poultney Xfmr/Fence	The primary reason for this Project is reliability to address asset management concerns. The existing three single-phase transformers at the South Poultney substation are 1920 vintage. Safety is also enhanced with installation of a new ground grid and advanced security to prevent unauthorized entry into the substation.	**Jun-18**	**$537,819**	**$537,819**	**Distribution/ Substation**	**Reliability**	
148622: East Jamaica Bkr/Rly/RTU/Sec	The primary reason for this project is to address asset management concerns to improve safety and reliability. The reliability portion of the project focuses on three main components including: the 1974 vintage vacuum GE breaker will be replaced with a new ABB RMAG circuit breaker. The electromechanical relays will be replaced with microprocessor relays that will allow remote fault diagnostics and future grid automation. The existing substation Remote terminal unit (RTU) is 1980 vintage electronic technology which is no longer supported by the vendor. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five-year period, allowing the migration to new technology utilizing digital communication between the master station and field devices. The safety portion of the project focus on the 414 switch on the high side of the transformer, adding a motor-operated airbreak (MOAB) for enhanced worker safety. Safety is also enhanced with the installation of a new ground grid and advanced security to prevent unauthorized entry into the substation.	**May-18**	**$549,797**	**$549,797**	**Distribution/ Substation**	**Reliability/Safety**	
152949: Sand Road 34kV Regulators	The primary reason for this project is reliability. This project will add two sets of 200 amps 34.5 kV circuit regulation at the Sand Road substation for the 33Y3 and 33Y4 circuits. The existing substation has no regulation at the substation for either 34.5 kV circuit. The lack of regulation resulted in problems keeping voltage at Sand Road within standards during a recent outage where Essex substation was out of service.	**Dec-18**	**$605,444**	**$605,444**	**Distribution Substation**	**Reliability**	
148596: Sharon Sub - GMP Portion	The proposed substation upgrade is being driven by the need to increase the transformer capacity at Sharon in order to accommodate the interconnection of a large solar project. The existing solar generation served by the substation, in combination with the proposed solar project, will exceed the top nameplate rating of the existing Sharon transformer. Due to this necessary upgrade, GMP will install the required upgrades for the ECM solar project, and at the same time, address asset management concerns to improve safety and reliability consistent with the strategies described in the company's approved Integrated Resource Plan. The solar project will pay for the upgrades associated specifically for the new solar project, however given GMP will have a portable transformer installed to complete this work it is prudent for GMP to address the asset management concerns at the same time. The existing 15kV breaker is 1973 vintage and will be replaced with a new ABB RMAG circuit breaker. The existing distribution steel will be raised to increase clearances, adding new yard stone, ground grid, new 7200V line VT and fuse, and alternate station service. Insulators and switches will be inspected and changed as necessary. The existing protective relaying will be upgraded to include line voltage sensing and provide SCADA control of new regulators. The existing steel, foundations, security system, conduits, protective relays and fencing will remain the same.	**Apr-18**	**$401,260**	**$401,260**	**Distribution/ Substation**	**Reliability**	
Work Order 34 Minor Additions and Installs	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in distribution substations in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of substation equipment such as lightening arresters, batteries, breakers and regulators.	**Monthly Closing Jan through Dec-18**	**$760,611**	**$760,611**	**Distribution/ Substation**	**Various**	Plant Addition ($) Based on historical 5 year average
	Rate Year 2018 Distribution Substations		**$8,095,279**	**$8,095,279**			
154222: Underhill TL134 Tap Pole Replacement	The primary reason for this Project is reliability. This line is a radial 34.5kV transmission line serving the Underhill Substation which does not have feeder backup. With no feeder back up for the distribution circuits, reliability of the transmission circuit is essential. The 106 structures being replaced on this transmission line from structure 17 to structure 127 consists of 1955 vintage poles and associated hardware. A past evaluation of 64 years old transmission poles that were recently replaced indicated that transmission poles should be replaced before they reach 60 years of age. All of the 64 year poles inspected had significant rot and pole top deterioration.	**Dec-17**	**$1,256,813**	**$1,256,813**	**Transmission Line**	**Reliability**	
153395: Pole RPLMNT-Johnson-Lowel L133	The primary reason for this Project is reliability. Based upon an Engineering Line Rating study, approximately 41 structures need to be replaced to achieve the required emergency line rating of 26 MVA. This emergency rating is needed for contingency situations occurring on the 115 kV transmission resulting in high flow on this 34.5 KV line. The majority of the structures requiring replacement are 1957 vintage. The initial intent of this study was to identify the necessary measures to increase the line's emergency capacity rating from 26MVA, its presumed existing Long Time Emergency (LTE) rating, to the 27MVA required to support the addition of a new nearby 5MW generator interconnection. After initial investigation, the study determined that the line in its current configuration cannot support the pre-project stated emergency rating of 26MVA.	**Nov-17**	**$549,772**	**$549,772**	**Transmission Lines**	**Reliability**	

147273: L92 Highbrdg - Lafayette Recon	The project's justification is primarily safety and reliability. VELCO's analytical studies in support of its most recent Long Range Plan identified the Highbridge-Lafayette 46 kV subtransmission path as potentially overloading to a very serious degree under credible first contingencies, in violation of GMP criteria. These overloads were high enough (139% of normal summer rating) to pose not only a reliability concern but also a safety concern. GMP's planning criteria for its subtransmission network (the Equal Slope Criterion) addresses this circumstance as follows: Above Equal Slope threshold load, any overhead conductor must be within 110% of its rating post-contingency, for all credible N-1 conditions. Without delving into the specific meaning and quantification of the "Equal Slope threshold load", the crux of this requirement is that overhead subtransmission lines (like the one that is the subject of this description) may never exceed 110% of their applicable thermal rating during any credible first contingency, such as that simulated in the VELCO Long Range Plan analysis. The underlying reason for this policy is that overloads of this magnitude may allow little time for operator remediation (such as sectionalizing, generation redispatch, or load-shedding) to prevent significant conductor sag below NESC clearances or potential burn down.	**Feb-17**	**$945,086**	**$945,086**	**Transmission Lines**	**Reliability**	
153580: WRutland to Danby TL36 P270-276 RPLMNT	This project is being done for Reliability and Safety. This project involves replacement of seven (7) late 1940 to early 1950 vintage poles and replacement of the existing conductor between Pole 270 and Pole 278. The poles on the Marble Street to Danby 46kV transmission line have been part of multi-year project to replace deteriorated structures. This section of the line crosses the Tinmouth Channel, one of the largest and most protect Class I wetlands in the state of Vermont, which is very difficult, at times dangerous, and costly to access. Due to this, the 1940 vintage 4/0 ACSR conductor is being replaced with new 477 MCM ASCR.	**Aug-17**	**$440,874**	**$440,874**	**Transmission Lines**	**Reliability/Safety**	
152431: Nason to Ballard TL 127 P151- 197 RPLMNT	This project's justification is primarily reliability. This project will replace structures on Georgia to Nason Street 34.5kV transmission line 127 to improve reliability and safety. The majority of the pole plant on this transmission line is late 1955 vintage, nearing the end of their useful life and deteriorating. An evaluation of 64-year-old transmission poles that were recently replaced in 2014 indicated that transmission poles should be replaced before they reach 60 years of age. All of the 64-year-old poles inspected had significant rot and pole top deterioration. GMP will continue with a systematic replacement program to upgrade these transmission line assets. As the age profile of an asset gets older and the quantity of older assets increases, it is likely that unforeseen capital expenditures will increase.	**Jun-17**	**$403,359**	**$403,359**	**Transmission Lines**	**Reliability/Safety**	
131747: Tafstville L107 MOAB	The primary justification for this project is Reliability. The Woodstock Tap presently has a three way Gang Operated AirBreak (GOAB) switch installed on a 1971 structure with shell rot and woodpecker holes. This project replaces the three way GOAB and its 1971 vintage structure with a SCADA controlled Motor Operated AirBreak (MOAB) on the Woodstock Tap 252 switch and two new GOAB switches (257 towards Woodstock and 251 towards Bethel). The 252 MOAB with load break capability improves reliability to the Woodstock area by providing remote sectionalizing capability for over ten (10) miles of 46kV transmission line. The SCADA MOAB (252) will provide much faster restoration in the event of a fault on the 46 KV between East Barnard and Taftsville (Line 107) , allowing for sectionalizing of the fault and the ability to pick up Woodstock substation, therefore minimizing outage times.	**Dec-17**	**$366,920**	**$366,920**	**Transmission Lines**	**Reliability**	
153582: MOAB South Bennington 556 514	The primary justification for this project is Reliability. This project will add SCADA controlled Motor Operated Airbreaks (MOABs) on the South Bennington 556 and 514 switches. Motor Operated Air Break (MOAB) with load break capability improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the radial 46 KV between Woodford and Pownal (Line 7) , allowing for sectionalizing of the fault and the ability to pick up South Bennington substation, therefore minimizing outage times .	**Oct-17**	**$348,792**	**$348,792**	**Transmission Lines**	**Reliability**	
151450: Nrutland to Wrultand TL 42 P22-42 RPLMNT	This project is being done to maintain the reliability and safety of this line. This project will replace deteriorating pole and crossarm plant on North Rutland to West Rutland 46kV transmission line 42 to improve reliability and safety. The majority of the plant on this transmission line is 1949 vintage with visible signs of rotten pole tops and crossarms.	**Apr-17**	**$230,919**	**$230,919**	**Transmission Lines**	**Reliability**	
153608: MOAB E. Montpelier WEC 317 617	The primary justification for this project is Reliability. This project will add SCADA controlled Motor Operators to existing Gang Operated Airbreaks with loadbreak capability on East Montpelier 317 and 617 switches. Motor Operated Air Break (MOAB) with load break capability improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It allow for faster restoration in the event of a fault on the 34.5 KV between Marshfield and Montpelier, allowing for sectionalizing of the fault and the ability to pick up East Montpelier WEC substation, therefore minimizing outage times .	**Nov-17**	**$201,697**	**$201,697**	**Transmission Lines**	**Reliability**	
148776: TL 3305 Graniteville Sub Reloc	The Graniteville substation upgrade is necessary to address asset management and National Electrical Safety Code (NESC) compliance concerns to improve safety and reliability. Please refer to project 143292 for the substation portion of the project. This project 148776 specifically addresses the upgrades to the transmission line serving the Graniteville substation. The transmission line will have two new SCADA Controlled Motor Operated Load Break switches installed on new structures to improve the reliability of the transmission line. These switches will allow the transmission line to be remotely sectionalized improving restoration time.	**Jun-17**	**$200,690**	**$200,690**	**Transmission Lines**	**Reliability**	
145182: L118 P317-1 Gilman Switch	Reliability is the primary reason for completing this project. This Project will improve reliability by placing MOAB's on the switch #152 and #377. Motor Operators Air Break (MOAB) /load break switches are necessary to improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation of the proposed SCADA enabled loadbreak Motor Operated Airbreak (MOAB) would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the VELCO St Johnsbury to Gilman 34.5kV line (Line 118), allowing Gilman to be fed from National Grid. It can also be utilized to feed Gilman for planned outages.	**Jul-17**	**$129,369**	**$129,369**	**Transmission Lines**	**Reliability**	
153396: Add MOAB L53 P105 Switch 325	The primary justification for this project is Reliability. This project will add SCADA controlled to an existing Motor Operated Airbreak (MOAB) on the normally open 325 switch between the radial 46kV line feeding the Rutland Gas Turbine and the networked 46kV line between Lalor Avenue Substation and Cold River Substation. Adding a SCADA controlled motor to the existing Gang Operated Air Break switch with load break capability improves reliability and facilitates the ability to restore power to the Rutland Gas Turbine substation for an outage of the Lalor Avenue Substation. Presently an outage to the Lalor Avenue substation results in the loss of the Rutland Gas Turbine and Lalor Avenue distribution substations, putting the area load at risk of not being able to use feeder backup. The installation would allow the Rutland Gas Turbine to be restored and increase the ability to utilize feeder backup to restore Lalor Avenue distribution load.	**Dec-17**	**$75,945**	**$75,945**	**Transmission Lines**	**Reliability**	
153385: Little River TLine Bypass	The primary driver for this project is reliability of the 34.5kV networked transmission system in the Middlesex and Waterbury area and local distribution load served out of the Little River Hydro facility. The 34.5 KV transmission line bypass is necessary to take the Little River Substation out of service for a planned hydro project while ensuring the reliability of the 34.5kV transmission system and local distribution load. This relocated transmission project will maintain the bypass to allow for an optimized configuration where the distribution load will be fed separately from the hydro station.	**Oct-17**	**$75,584**	**$75,584**	**Transmission Lines**	**Reliability**	

151448: Nrutland to Wrutland TL 42 P43-54 RPLMNT	This project is being done to maintain the reliability and safety of this line. This project will replace deteriorating pole and crossarm plant on North Rutland to West Rutland 46kV transmission line 42 to improve reliability and safety. The majority of the plant on this transmission line is 1949 vintage with visible signs of rotten pole tops and crossarms.	**May-17**	**$70,362**	**$70,362**	**Transmission Lines**	**Reliability/Safety**	
148242: White River Jct Fiber	This project is required for reliability, customer service and safety. This fiber is the communications to the White River Junction substation. It is used to control and monitor the proper operation of the substation and the WRJ Tap. This communications is used to operate breakers in the substation and motor-operated air breaks remotely from the GMP Control Centers. This is critical when during storm or other outage situations lines need to be sectionalized or restored without dispatching a crew to close circuits back in manually. That function decreases the time customers are out of service. It is also critical for safety to open circuits during emergencies such as car pole accidents, fires or storms when live wires are down and putting the public at risk. This fiber provides that capability.	**Jan-17**	**$60,472**	**$60,472**	**Transmission Lines**	**Reliability**	
148604: Wyeth Tap RTU Replacement	This project is being done for Reliability of the Transmission system. The remote terminal unit (RTU) is 1980 vintage electronic technology which is no longer supported by the vendor. Furthermore, the RTU communicates with the master SCADA front end processor (FEP) located in the Systems Operations Headquarters. The FEP is a server of the same vintage as the RTU which is also no longer supported. Failure of an FEP will result in loss of SCADA to as many as twenty facilities. GMP has approximately thirty-four (34) RTUs with the 1980 vintage technology communicating to two (2) FEPs. The FEPs can not be replaced until all RTUs have been upgraded. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five year period allowing the migration to new technology utilizing digital communication between the master station and field devices.	**Jul-17**	**$52,067**	**$52,067**	**Transmission Lines**	**Reliability**	
148605: Silk Road Tap RTU Replacement	This project is being done for Reliability of the Transmission system. The remote terminal unit (RTU) is 1980 vintage electronic technology which is no longer supported by the vendor. Furthermore, the RTU communicates with the master SCADA front end processor (FEP) located in the Systems Operations Headquarters. The FEP is a server of the same vintage as the RTU which is also no longer supported and no parts are available. Failure of an FEP will result in loss of SCADA to as many as twenty facilities. GMP has approximately thirty-four (34) RTUs with the 1980 vintage technology communicating to two (2) FEPs. The FEPs can not be replaced until all RTUs have been upgraded. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five year period allowing the migration to new technology utilizing digital communication between the master station and field devices.	**Jul-17**	**$43,893**	**$43,893**	**Transmission Lines**	**Reliability**	
135212: South Shaftsbury MOAB	This project is being done for Reliability of the Transmission system. The remote terminal unit (RTU) is 1980 vintage electronic technology, which is no longer supported by the vendor. Furthermore, the RTU communicates with the master SCADA front end processor (FEP) located in the Systems Operations Headquarters. The FEP is a server of the same vintage as the RTU, and the FEP is also no longer supported. Failure of an FEP will result in loss of SCADA to as many as twenty facilities. GMP has approximately thirty-four (34) RTUs with the 1980 vintage technology communicating to two (2) FEPs (Front End Processors). The FEPs cannot be replaced until all RTUs have been upgraded. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five year period, allowing the migration to new technology utilizing digital communication between the master station and field devices. This project was completed in November 2016; however the project closing occurred in January 2017.	**Jan-17**	**$37,434**	**$37,434**	**Transmission Line**	**Reliability**	
WO 32 Minor Additions Install	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in transmission substations and transmission lines in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of equipment such as lightening arresters, batteries, breakers, transmission poles and insulators. These upgrades are not growth related.	**Monthly Closing Jan through Dec-17**	**$1,276,603**	**$1,276,603**	**Transmission Lines/ Substations**	**Various**	Plant Addition ($) Based on historical 5 year average
	Interim Year 2017 Transmission Lines		**$6,766,652**	**$6,766,652**			
148600: Reconductor L37 (MST to Flor)	This project's justification is primarily reliability. This project is one component of a larger initiative, known as the Rutland Area Reliability Project (RARP), designed to improve reliability to the Rutland area. This component of the RARP specifically deals with rebuilding approximately 7.22 miles of 46kV transmission line from the Florence Substation to the Marble Street Substation. The Vermont Marble Power Division (VMPD) 46 kV transmission and distribution systems located just to the northwest of Rutland have been customarily viewed as distinct from the nearby GMP system due to VMPD's previously independent ownership and normally open tie to the GMP system at West Rutland. However, several years ago it was acquired by GMP (CVPS at that time) and is now viewed as an integral part of the greater Rutland area with interrelated problems and opportunities. Load still peaks in summer and it constitutes about 30 Mw of peak summer load, caused in large part by a major industrial customer. This system is currently supplied solely by VELCO's Florence 115/46 kV transformer and by whatever interna hydro generators are dispatched. Although there are no specific reliability criteria that limit the amount of single-sourced load, it is the opinion of GMP that having 30 Mw so configured is undesirable, and that a redundant network solution is necessary. After extensive loadflow analysis, it was determined that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1) Permanent closure of the normally-open 46 kV B7 tie at West Rutland; 2) Florence-West Rutland 46 kV line reconductoring; 3) West Rutland-Marble Street 46kV line reconductoring; and 4) Permanent closure of the normally-open (2nd) Rutland-West Rutland 46 kV line with reconductoring. These upgrades are required to improve the connectivity and consequent reliability of the former VMPD system that serves GMP's customers in Florence, Danby, and Proctor. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to carry, without reconductoring. Further analysis shows that the Rutland area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency.	**Jul-18**	**$2,729,443**	**$2,729,443**	**Transmission Lines**	**Reliability**	

148595: Cambridge Transmission L131	This project is being completed for reliability and safety, and is part of a larger initiative to upgrade an existing VEC 34.5 KV substation in Cambridge , VT. Specifically, this project provides a second tap line off an existing GMP owned 34.5 KV transmission line that feeds this VEC Cambridge substation. The Project proposes to install a transmission substation at the VEC Cambridge substation which will segment the existing transmission line from East Fairfax to Johnson into two transmission lines, one from East Fairfax to Cambridge and the other from Johnson to Cambridge. The conductor on the tap lines will be 477 ACSR. GMP will install a Motor Operated Load Break (MOLB) switch outside of the Cambridge substation to serve as a bypass for the substation to facilitate substation switching activities. VEC has identified the Cambridge Substation Project in their Integrated Resource Plan to address asset management and safety issues. This substation structure has been identified as the worst on the VEC system. The structure is very congested, it is a hybrid wood/steel structure that has been modified several times over its life. VEC and GMP worked on a joint owned station design/concept that could include GMP owned in/out transmission line breakers. The Vermont Electric Plan encourages utilities to communicate and coordinate with other electric utilities to share information and develop system upgrades that can cost effectively benefit both utilities.	**Sep-18**	**$415,635**	**$415,635**	**Transmission Lines**	**Reliability/Safety**	
153590: MOAB Thetford 926 & 927	The primary justification for this project is Reliability. This project will add SCADA controlled Motor Operated Airbreaks (MOABs) on the Thetford 926 and 927 switches. Motor Operated Air Break (MOAB) with load break capability improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV between Hartford and Bradford (Line 109), allowing for sectionalizing of the fault and the ability to pick up Thetford substation, therefore minimizing outage times .	**Dec-18**	**$356,202**	**$356,202**	**Transmission Lines**	**Reliability**	
148599: Reconductor L39 (WRT to MST)	This project's justification is primarily reliability. This project is one component of a larger initiative, known as the Rutland Area Reliability Project (RARP), designed to improve reliability to the Rutland area. This component of the RARP specifically deals with rebuilding approximately 0.6 miles of 46kV transmission line from the West Rutland Substation to the Marble Street Substation. The Vermont Marble Power Division (VMPD) 46 kV transmission and distribution systems located just to the northwest of Rutland have been customarily viewed as distinct from the nearby GMP system due to VMPD's previously independent ownership and normally open tie to the GMP system at West Rutland. However, several years ago it was acquired by GMP (CVPS at that time) and is now viewed as an integral part of the greater Rutland area with interrelated problems and opportunities. Load still peaks in summer and it constitutes about 30 Mw of peak summer load, caused in large part by a major industrial customer. This system is currently supplied solely by VELCO's Florence 115/46 kV transformer and by whatever internal hydro generators are dispatched. Although there are no specific reliability criteria that limit the amount of single-sourced load, it is the opinion of GMP that having 30 Mw so configured is undesirable, and that a redundant network solution is necessary. After extensive loadflow analysis, it was determined that the VMPD system could "ride through" a first contingency loss of its Florence 115/46 kV source, provided that the following system reinforcements were made: 1) Permanent closure of the normally-open 46 kV B7 tie at West Rutland; 2) Florence-West Rutland 46 kV line reconductoring, 3) West Rutland-Marble Street 46kV line reconductoring; 4)-Permanent closure of the normally-open (2nd) Rutland-West Rutland 46 kV line with reconductoring. These upgrades are required to improve the connectivity and consequent reliability of the former VMPD system that serves GMP's customers in Florence, Danby, and Proctor. Specifically, the existing Florence to West Rutland path could not carry the peak demand that it would have to carry, without reconductoring. Further analysis shows that the Rutland area system also benefits substantially from the integration of VMPD, by effectively adding another 115/46 kV transformer in support of the area's 46 kV network (via Florence/West Rutland). This extra source improves area voltage and reduces loading on the area's other transformers, which could otherwise exceed their ratings post-contingency.	**Aug-18**	**$353,275**	**$353,275**	**Transmission Lines**	**Reliability**	
153594: MOAB E. St. Albans 126 & 127	The primary justification for this project is Reliability. This project will add SCADA operated Motor Operated Airbreaks (MOABs) on the East St. Albans 126 and 127 switches. Motor Operated Air Break (MOAB) with load break capability are necessary to improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 34.5 KV between Welden Street and North St. Albans, allowing for sectionalizing of the fault and the ability to pick up East St. Albans substation, therefore minimizing outage times.	**Dec-18**	**$359,845**	**$359,845**	**Transmission Lines**	**Reliability**	
135206: Riverside MOAB	The primary justification for this project is Reliability. This project will add SCADA controlled Motor Operators to existing Gang Operated Airbreaks with loadbreak capability on the Riverside 177 and 174 switches. Motor Operated Air Break (MOAB) with load break capability improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 46 KV line between Cavendish and South Street, allowing for sectionalizing of the fault and the ability to pick up Riverside substation, therefore minimizing outage times.	**Dec-18**	**$235,585**	**$235,585**	**Transmission Lines**	**Reliability**	
153750: Welden to NStAlbans TL135 P238-246 Recond	This project is being done for Reliability and safety . This project involves the reconductoring of .41 miles of 3/0 ACSR to 477 ACSR between Welden St. and tap to East St. Albans (Line 135). GMP engaged VELCO to complete as study for a proposed load increase in the St. Albans area. The study identified an existing overload of the Welden St - East St Albans 3/0 ACSR line segment. This segment was overloaded by more than 10% when the Nason St end of the B10 line was opened at existing loads.	**Dec-18**	**$252,337**	**$252,337**	**Transmission Lines**	**Reliability/Safety**	
153593: MOAB Jeffersonville 191 & 436	The primary justification for this project is Reliability. This project will add SCADA controlled Motor Operators to existing Gang Operated Airbreaks with loadbreak capability on the Jeffersonville 191 & 436 switch. Motor Operated Air Break (MOAB) with loadbreak capability improve reliability and facilitate restoration by providing sectionalizing capability during contingencies. The installation would allow the line to be sectionalized under load remotely. It will allow for faster restoration in the event of a fault on the 34.5 KV between East Fairfax and Johnson (Line 131), allowing for sectionalizing of the fault and the ability to pick up Jeffersonville substation, therefore minimizing outage times.	**Dec-18**	**$205,560**	**$205,560**	**Transmission Lines**	**Reliability**	

148615: L107 Recond Bethel SS to P269	This project's justification is primarily reliability. Studies conducted by ISO-NE and VELCO determined that upgrading an existing 115 kV line, supplemented with other component transmission and subtransmission upgrades, would be the most cost-effective solution to mitigate the identified concerns. Recent studies conducted by ISO-NE and VELCO, to comply with NERC and NPCC requirements, revealed that a variety of N-1-1 transmission contingency scenarios could result in Rutland and Central Vermont area load loss of as much as 340 MW, which violates ISO-NE transmission performance criteria. A number of subtransmission line segments were identified as needing to be reconductored to address potential overloads under certain contingency conditions, as demonstrated by the VELCO study. One of these segments is Bethel to East Barnard (Line107) line. VELCO is currently in the 248 process for the other VELCO System upgrades identified in the Connecticut River Valley under Docket 8605. The need for this GMP line upgrade is identified in this filing. The VELCO prefiled testimony states "Related to these improvements, GMP will replace conductors for four 46 kV line sections :the East Middlebury to Smead Road line, Smead Road to Silver Lake line, the Bethel to East Barnard line and the Windsor to Taftsville line. GMP will file a separate petition requesting a certificate of public good to perform this work."	**Nov-18**	**$158,359**	**$158,359**	**Transmission Lines**	**Reliability**	
143570: Fiber to Marshfield	This project is being done for operational efficiency and reliability of the control system. The fiber cable system will allow GMP to install an RTU to monitor and control the gates at the dam. The fiber will facilitate new cameras being installed at the dam, allowing the Control Center personnel to view the status of the water and the dam.	**Jan-18**	**$122,731**	**$122,731**	**Transmission Lines**	**Reliability**	
WO 32 Minor Additions Install	Capital Blanket expenditures to replace or repair deteriorated or failed in equipment in transmission substations and transmission lines in order to maintain system capability and reliability. Typical projects in this blanket work order include, but are not limited to, replacement of equipment such as lightening arresters, batteries, breakers, transmission poles and insulators. These upgrades are not growth related.	**Monthly Closing Jan through Dec-18**	**$1,292,177**	**$1,292,177**	**Transmission Lines/ Substations**	**Various**	Plant Addition ($) Based on historical 5 year average
	Rate Year 2018 Transmission Lines		**$6,481,149**	**$6,481,149**			
143582: Sand Road Bus Diff-Animal Miti	The primary reason for this Project is reliability. This Project will enhance relay protection schemes with the addition of bus differential relaying and breaker failure protection. Further reliability enhancements are afforded by this project with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serve three distribution circuits, one 12.47 kV circuit and two 34.5 kV circuits. The distribution circuits out of this substation provide feeder ties to Essex and Tafts Corners circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. The engineering process takes into account the different approach an animal might take that ultimately leads to it making contact by either climbing or flying into the substation. The animal protection is form-fitted for its exact location and placed either on live parts or the ground to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Dec-17**	**$757,280**	**$757,280**	**Transmission Substation**	**Reliability**	
143454: VELCO - Hartford Bkr RPMNT	The primary reason for this breaker replacement project is reliability. At Hartford substation, the existing 46kV H83 breaker is a single tank, oil circuit breaker installed in 1974, making it 42 years old . GMP has experienced five failures of this type of breakers in the last decade, attributed to various reasons including internal tank faults, moisture ingress and bearing failures. Reliability concerns with the single tank oil circuit breaker have risen over the years due to internal faults, mainly during cold weather conditions. At the same time, this breaker is controlled by 1970 vintage electro-mechanical relays. The age and type of the relays makes them very difficult to maintain as they now fall out of calibration easier and spare parts are not readily available. The 46kV breaker will be replaced with a vacuum type. The existing control panels will be retrofitted to accommodate the new modern multi-function microprocessor relays. All control wiring will be replaced. Other ancillary equipment that will be replaced includes the dual bushing line voltage transformer, lightning arresters, and breaker disconnect switches.	**Jun-17**	**$537,347**	**$537,347**	**Transmission Substation**	**Reliability**	
153292: Essex No 19 Animal Mitigation	The primary reason for this Project is reliability. This Project will install animal protection at the Essex #19 34.5 kV Substation. This animal protection is being installed on the 34.5 kV bus, disconnect switches, breakers and two 34.5/12.47 kV transformers. This substation serves five 12.47 kV circuits and one 34.5 kV circuit. The 34.5 kV bus also feeds hydro and diesel generation and lines extending to Lime Kiln, Sand Road, Airport and VELCO Essex substations. This substation provides backup feeder ties to Digital, Tafts Corners, Sand Road and Gorge circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Jun-17**	**$442,367**	**$442,367**	**Transmission Substation**	**Reliability**	
153384: Digital_43 Animal Mit/Brk Fail	The primary reason for this Project is reliability. This Project will enhance relay protection schemes with the addition of breaker failure relaying. Further reliability enhancements are afforded by this project with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves four 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Essex and Tafts Corners circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Jul-17**	**$427,006**	**$427,006**	**Transmission Substation**	**Reliability**	
153122: Queen City Bkr Replacement	The primary reason for this Project is reliability and safety. The existing 3332 breaker is a 1974 vintage GE FKA oil breaker which will be replaced with 38 KV R-MAG breaker. GMP has experienced catastrophic failures of this type of breaker in the past. FKA failures occurred at both the Ascutney and West Rutland substation. There have also been water ingress problems for this breaker type at the Fairfax and Woodford Road substations. This Project will also install animal protection at the Queen City #32 34.5 kV Substation. This animal protection is being installed on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation serves three 12.47 kV circuits and two 34.5 kV circuits . This substation provides feeder ties to Dorset Street and Shelburne circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Sep-17**	**$439,891**	**$439,891**	**Transmission Substation**	**Reliability**	

149349: Spare 46-34kV Autotransformer	The purchase of this spare transformer is for reliability in the event that an existing 46/34.5 kV Autotransformer fails. Currently the company has 46/34.5 kV Autotransformers at Ryegate, Lowell, East Barnard and Mendon. The East Barnard, Lowell and spare on site at Mendon are all identical in size (15/20/22.4 MVA) and age (1973). The Ryegate transformer is 15/18.75 MVA and was built in 1964. The Mendon energized unit is a 20/25/28 MVA unit and is of 1992 vintage. Given that GMP does not have a portable, in the event there was a transformer failure, the Mendon spare would have to be utilized. Given that the time to acquire a new transformer could be between 8-12 months, it is deemed prudent to order an additional spare.	**May-17**	**$368,324**	**$368,324**	**Transmission Substation**	**Reliability**	
151761: Gorge Animal Cover	The primary reason for this Project is reliability. This Project will install animal protection at the Gorge #16 34.5 kV Substation. This animal protection is being installed on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation serves two 12.47 kV circuits, one 34.5 kV circuit and a hydro generator. This substation provides feeder ties to Ethan Allen and Essex circuits. The animal protection system protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Jan-17**	**$248,194**	**$248,194**	**Transmission Substation**	**Reliability**	
138424: HSCAT 3306 PUTT	This project is being done for Safety and Reliability of the Transmission system. The project is designed to improve power quality by using a communications-aided tripping scheme to reduce voltage dips duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction.	**Dec-17**	**$80,502**	**$80,502**	**Transmission Substation**	**Reliability**	
148601: Ascutney Security	This project is being done for Safety of the Transmission substation. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation. The Ascutney substation is a critical site for system reliability . It is a very large site and due to the critical nature of the site it was determined to need security.	**Jul-17**	**$77,181**	**$77,181**	**Transmission Substation**	**Reliability**	
148603: Digital #43 Security	This project is being done for Safety of the Digital Transmission substation. The project is designed to improve safety with remote indication and recording of unauthorized entry into the substation. This substation is part of the network transmission system and also serves four 12.47kV distribution circuits including 43G1, 43G2, 43G3 and 43G4. The distribution circuits out of this substation provides feeder ties to Essex and Tafts Corners circuits. The substation is critical to the subtransmission network and given a series of intrusions resulting in the theft of ground wires and other copper components in various substations, GMP has determined that we should increase security.	**Jul-17**	**$52,018**	**$52,018**	**Transmission Substation**	**Reliability**	
143311: Irasburg R/C Upgrade - Velco	The primary reason for the project is for reliability on the transmission system. The Irasburg line protection relays for the H14 breaker (to Lowell 46 kV) are currently 42 years old and have exceeded the VELCO age criteria. This project will replace the existing GCY electromechanical line protection relays and the reclosing scheme.	**Jan-17**	**$45,017**	**$45,017**	**Transmission Substation**	**Reliability**	
153863 – Pleasant St Capacitor Replacement	The primary reason for this Project is reliability. This project will replace the existing 1990 5.4 MVAR 46 KV General Electric capacitor bank with new capacitors and fuses located at the Pleasant Street substation for asset management. This will include the replacement of 36 individual 150 kVAR cans and fuses. This capacitor bank is needed to provide voltage support during emergency contingency situations as well as during planned maintenance on the Randolph area 46 KV network. The existing cans are bulging and in some cases leaking, resulting in the capacitor bank not being useable in its current state.	**Jul-17**	**$41,127**	**$41,127**	**Transmission Substation**	**Reliability**	
153412: Velco Cold Rv H31,H32 VT RPLMT	The Primary reason for this Project is reliability. This project will replace voltage transformers at the VELCO Cold River substation on the 46 kV. These voltage instrument transformers were installed in 1980 and have exceeded the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	**Nov-17**	**$18,864**	**$18,864**	**Transmission Substation**	**Reliability**	
153411: Velco Berlin X91 VT RPLMNT	The Primary reason for this Project is reliability. This project will replace voltage transformers at the VELCO Berlin substation on the 34.5 kV. These voltage instrument transformers were installed in 1982 and are approaching the manufacturer's life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	**Nov-17**	**$9,432**	**$9,432**	**Transmission Substation**	**Reliability**	
	Interim Year 2017 Transmission Substations		**$3,544,550**	**$3,544,550**			
148592: Cambridge Substation	Vermont Electric Cooperative has identified this Project in their Integrated Resource Plan to address asset management and safety issues. This substation structure has been identified as the worst on the VEC system. The structure is very congested, and it is a hybrid wood/steel structure that has been modified several times over its life. VEC is working with GMP on a joint-owned station design/concept that would include GMP owned in and out transmission line breakers. GMP has entered into a Joint Ownership Agreement with VEC for the construction of this substation. The Vermont Electric Plan encourages utilities to communicate and coordinate with other electric utilities to share information and develop cost effective system upgrades that can benefit both utilities. This is such a project.	**Dec-18**	**$1,040,932**	**$1,040,932**	**Transmission Substation**	**Reliability**	
153386: Little River Sub Rebuild	The primary driver for this project is reliability. The Project's ability to help GMP lower the risk of loss of load and hydro production due to equipment failure is a large benefit. The existing 34.5 kV transmission breakers 3312 and 3313 are single tank oil circuit breakers and over 50 years old. GMP has experienced catastrophic failures of this style of breaker at both the Ascutney and West Rutland substations. There have also been water ingress problems for this breaker type at the Fairfax and Woodford Road substations. The 34.5 kV breakers will be replaced with vacuum types. Other ancillary equipment that will be replaced include oil filled potential transformers (PTs), breaker disconnect switches and insulators that are 1954 vintage. The voltage instrument transformers (VT) are being replaced for safety and reliability. GMP proposes to replace 1968 vintage five (5) VTs, all of which are 40 years old or more. The design life expectancy of this style of VTs is 40 years old per the manufacturer. GMP has had failures of this style of VT with the earliest failure occurring after 36 years of service. Accordingly, GMP has adopted a policy of replacing units 35 years and older to ensure safety and system reliability. The 1954 vintage breaker disconnects and bus support insulators are being replaced for reliability and safety. One of the main purposes of insulators is to support mechanical loading, whether it being static loading of bus work or dynamic loading of disconnect switches. Both the breaker disconnects and the bus support insulators are equipped with a style of insulator that is prone to age related failure. These disconnect switches are being replaced because of this older insulator type. These switches are used during switching activities where the person doing switching exerts a force on the hook-operated disconnect to open it. GMP has experienced these devices breaking off during switching activities. For the safety of its workers, GMP replaces this type of switch during substation upgrades. The GOAB (1953 vintage) is being replaced for the same reasons as the breaker disconnect switches discussed above.	**Jun-18**	**$974,055**	**$974,055**	**Transmission Substation**	**Reliability**	

143642: Chelsea Upgrade - VELCO CRVP	The main reason for this project is reliability. The existing Chelsea 46kV H81 breaker is a single tank, oil circuit breaker installed in 1970, making it 46 years old . Reliability concerns with the single tank oil circuit breaker have risen over the years due to internal faults, mainly during cold weather conditions. GMP has experienced five failures of this type of breakers in the last decade, attributed to various reasons including internal tank faults, moisture ingress and bearing failures. At the same time, this breaker is controlled by 1970 vintage electro-mechanical relays. The age and type of the relays makes them very difficult to maintain as they now fall out of calibration more easily and spare parts are no longer available. As part of VELCO's 115kV upgrade at Chelsea substation, VELCO will be installing a temporary 115kV to 46kV configuration to allow the existing 115kV and 46kV yards to be taken out of service. While the existing 46kV yard is out of service, it is an opportune time to complete this project. The 46kV breaker will be replaced with a vacuum type. A new relay/protection cabinet will be installed with modern multi-function microprocessor relays. All control wiring will be replaced. Other ancillary equipment that will be replaced including the dual bushing line voltage transformer, lightning arresters, and breaker disconnect switches.	**Jun-18**	**$477,231**	**$477,231**	**Transmission Substation**	**Reliability**	
153119: McNeil Animal Mit/Brk Fail	The primary reason for this Project is reliability. This Project will enhance relay protection schemes with the addition of breaker failure relaying. Further reliability enhancements are afforded by this project with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Aug-18**	**$307,802**	**$307,802**	**Transmission Substation**	**Reliability**	
148598: Marble Street Bus Upgrade	The primary reason for this project is reliability. It is driven by the planned projects identified in the Rutland Area Reliability Plan ((1) 46 kV Florence-Marble Street reconductoring Project #148599, 2) 46 kV Marble Street-West Rutland reconductoring Project #148600) submitted to the PSB in April 2015. The strain-bus replacement is required to ensure achieve a strain bus ampacity rating that the two related conductor upgrades are not thermally limited or undercut by this intermediate strain-bus. Further reliability enhancements are realized with the replacement of two gang operated air break (GOAB) switches with SCADA controlled motor operated load break (MOLB) switches.	**Sep-18**	**$291,721**	**$291,721**	**Transmission Substation**	**Reliability**	
153802: Dorset St Animal Mitigation	The primary reason for this Project is reliability. This Project will enhance with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves four 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Town Line, Digital, Queen City and Shelburne circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Sep-18**	**$84,734**	**$84,734**	**Transmission Substation**	**Reliability**	
153804: Ethan Allen Animal Mitigation	The primary reason for this Project is reliability. This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves four 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Gorge and Mallets Bay circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Aug-18**	**$138,476**	**$138,476**	**Transmission Substation**	**Reliability**	
153799: Malletts Bay Animal Mitigation	The primary reason for this Project is reliability. This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves two 12.47kV distribution circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Jun-18**	**$90,071**	**$90,071**	**Transmission Substation**	**Reliability**	
153801: Town Line Animal Mitigation	The primary reason for this Project is reliability. This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves two 12.47kV distribution circuits. The distribution circuits out of this substation provide feeder ties to Digital and Dorset Street circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Sep-18**	**$105,346**	**$105,346**	**Transmission Substation**	**Reliability**	
153800: Iroquois Sub Animal Mitigation	The primary reason for this Project is reliability. This Project will enhance reliability with the addition of animal protection on the 34.5 kV bus, disconnect switches, breakers and 34.5/12.47 kV transformer. This substation is part of the network transmission system and also serves two 12.47 kV distribution circuits. The animal protection system that protects substation assets and increases reliability by eliminating outages caused by animal contact. This engineering process takes into account the different approach an animal might take that ultimately leads to them making contact by either climbing or flying into the substation. The animal protection is form fitted for its exact location and placed either on live parts or the ground plain to eliminate the difference of potential in locations where animal contact is most likely to occur.	**Jul-18**	**$47,045**	**$47,045**	**Transmission Substation**	**Reliability**	
138422: HSCAT 3313 PUTT	This project is being done for Safety and Reliability of the Transmission system. The project is designed to improve power quality by using a communications-aided tripping scheme to reduce voltage dips duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction.	**Apr-18**	**$84,552**	**$84,552**	**Transmission Substation**	**Reliability**	

148627: Rawsonville RTU Replacement	This project is being done for Reliability of the Transmission system. The remote terminal unit (RTU) is 1980 vintage electronic technology which is no longer supported by the vendor. Furthermore, the RTU communicates with the master SCADA front end processor (FEP) located in the Systems Operations Headquarters. The FEP is a server of the same vintage as the RTU which is also no longer supported. Failure of an FEP will result in loss of SCADA to as many as twenty facilities. GMP has approximately thirty-four (34) RTUs with the 1980 vintage technology communicating to two (2) FEPs. The FEPs can not be replaced until all RTUs have been upgraded. In an effort to migrate from the vintage unsupported technology, GMP is planning to replace RTUs over a five year period allowing the migration to new technology utilizing digital communication between the master station and field devices.	**Dec-18**	**$84,043**	**$84,043**	**Transmission Substation**	**Reliability**	
138419: HSCAT 3312 87L	This project is being done for Safety and Reliability of the Transmission system. The project is designed to improve power quality by using a communications-aided tripping scheme to reduce voltage dips duration during a fault. This allows sensitive electronic loads to ride through temporary system disturbances which otherwise would have caused the electronic loads to shut off or malfunction.	**Mar-18**	**$51,770**	**$51,770**	**Transmission Substation**	**Reliability**	
153410: Velco Blissville H30 VT RPLMNT	The primary reason for this Project is reliability. This project will replace voltage transformers at the VELCO Blissville substation on the 46 kV. These voltage instrument transformers were installed in 1972 and have exceeded the manufacturers life expectancy. GMP has experienced failures of this vintage and style of voltage instrument transformers. This equipment is used to provide voltage information to protective equipment, and the SCADA for remote indication.	**Feb-18**	**$9,432**	**$9,432**	**Transmission Substation**	**Reliability**	
	Rate Year 2018 Transmission Substations		**$3,787,209**	**$3,787,209**			

Total Distribution Interim Year 2017 Rate Adjustment			**$27,410,560**
Total Transmission Interim Year 2017 Rate Adjustment			**$10,311,203**

Total Distribution Interim Year 2018 Rate Adjustment			**$33,105,913**
Total Transmission Interim Year 2018 Rate Adjustment			**$10,268,358**