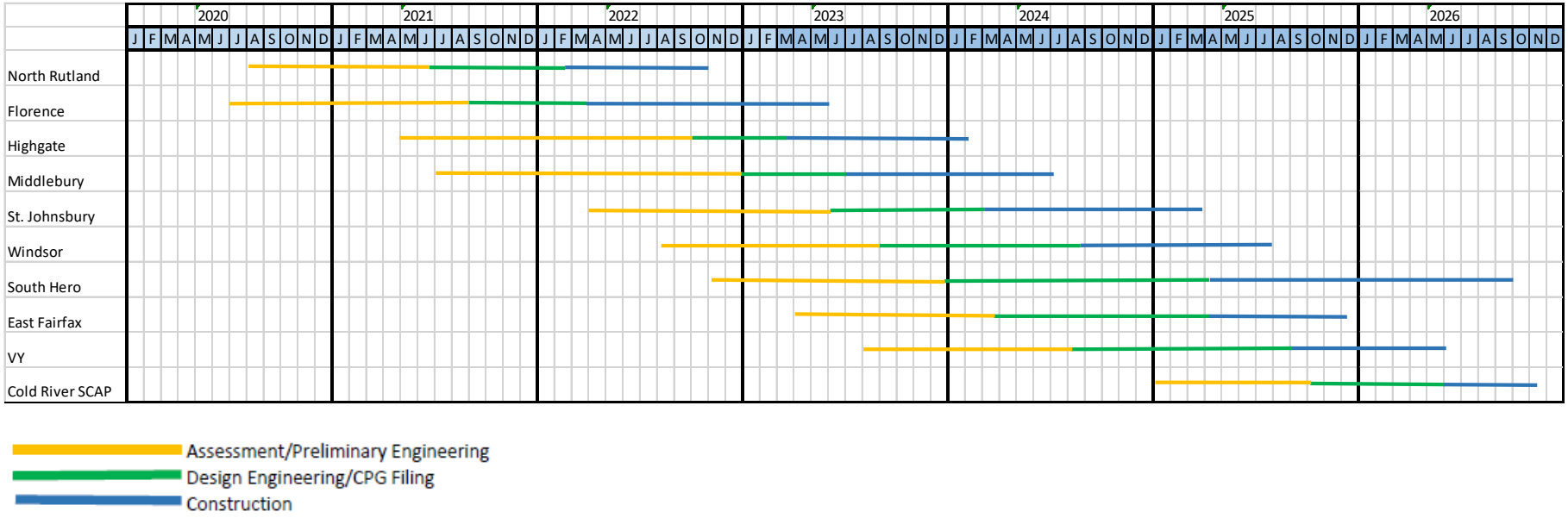
Substation Condition Assessment Project Update

vermont electric power company
VELCO

Operating Committee
February 16, 2023

Overall SCAP Schedule



Progress to Date:

7 Substations Completed - Newport, St. Albans, Barre, Berlin, Sandbar, Irasburg, North Rutland

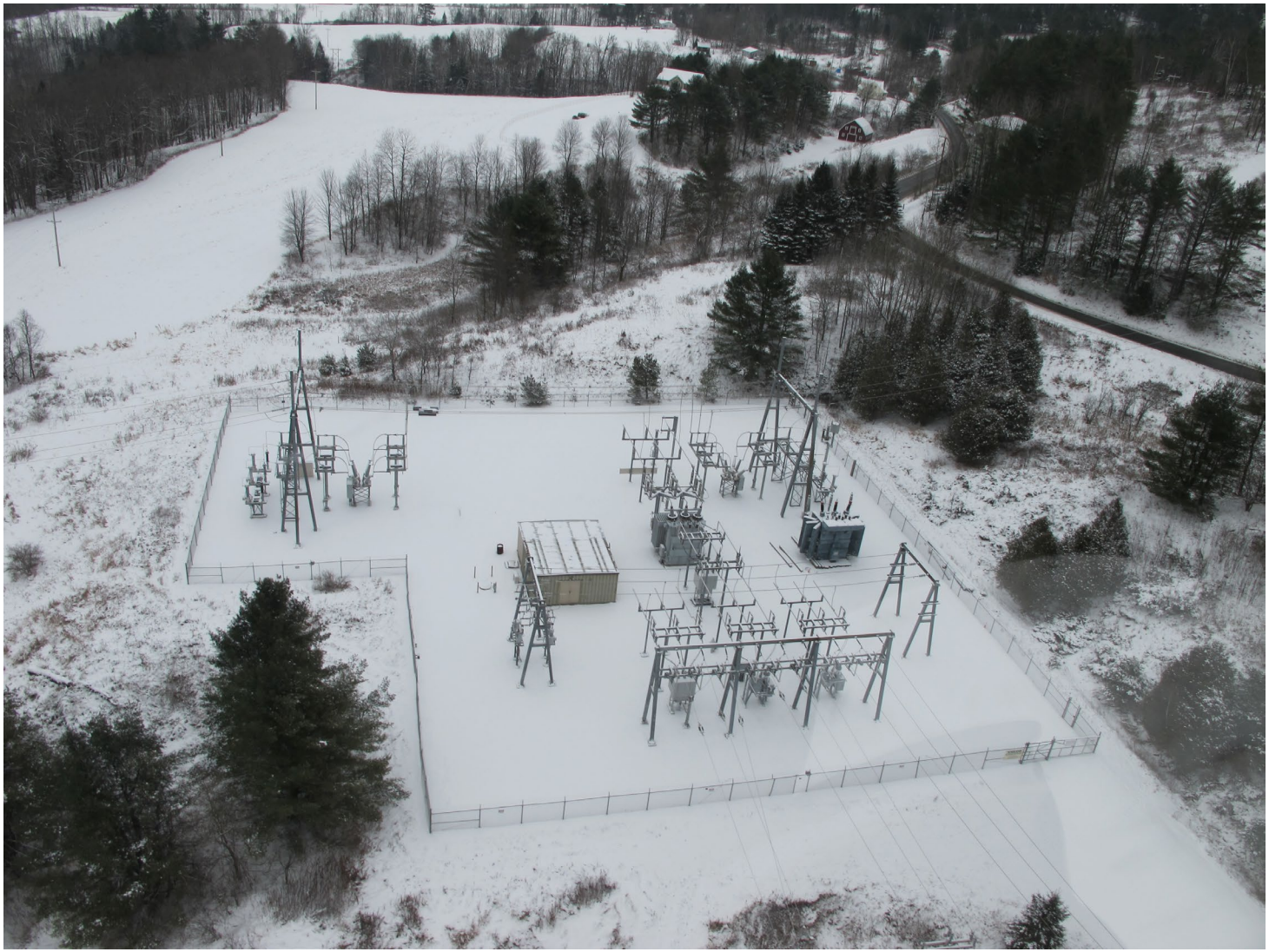
2 Substations under Construction – Florence, Highgate

1 Substation under Permitting – Middlebury

2 Substations under Assessment – St. Johnsbury, Windsor

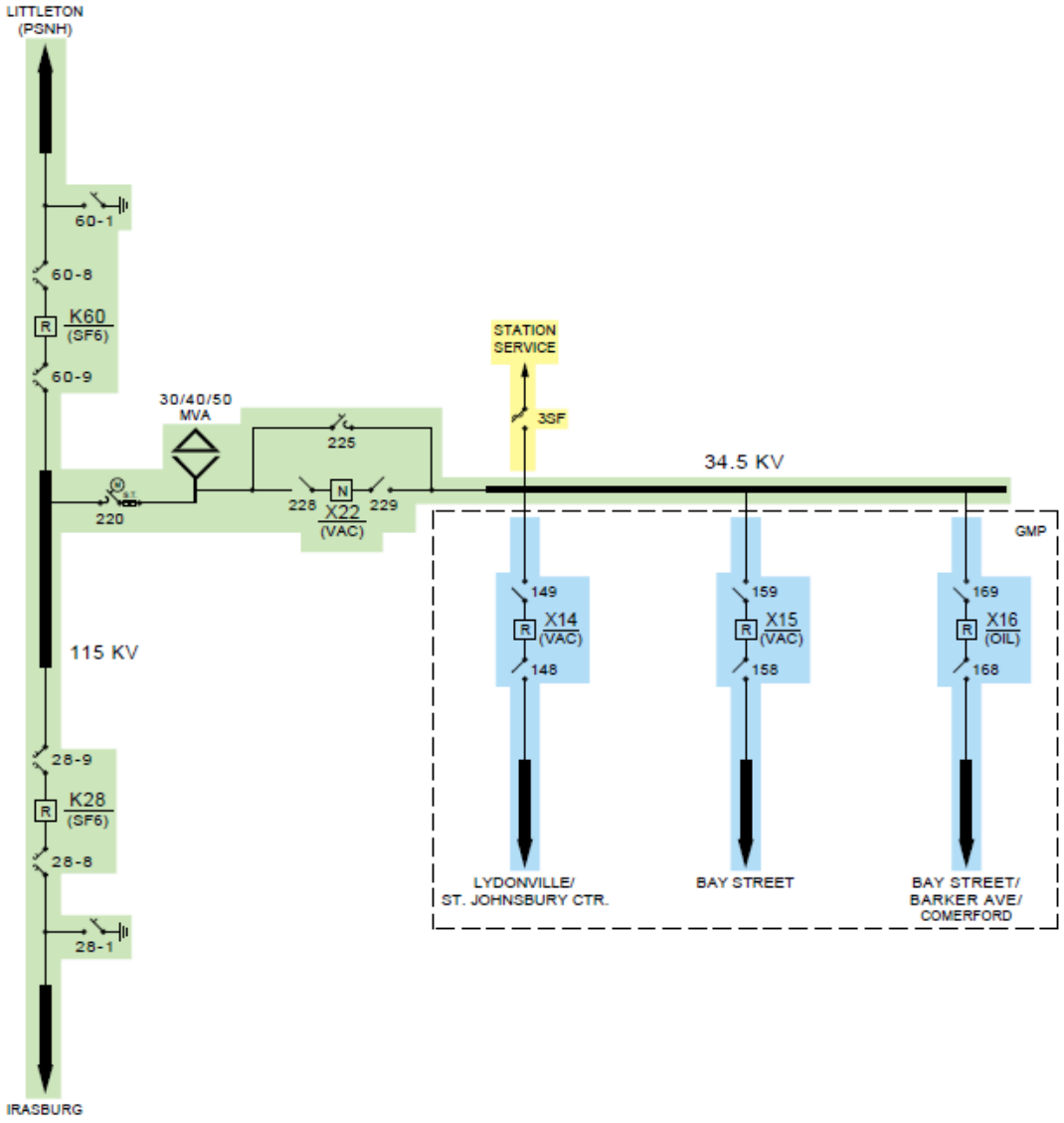
4 Substations Remaining – South Hero, East Fairfax, VY, Cold River

St. Johnsbury Substation



397 Higgins Hill Road, St. Johnsbury, VT 05819

St. Johnsbury Facility Classification Diagram



Facilities Classification Diagram Legend

ISO NEW ENGLAND PTF FACILITIES (COMMON FACILITIES):

POOL TRANSMISSION FACILITIES (PTF) ARE THE TRANSMISSION FACILITIES OWNED BY PARTICIPATING TRANSMISSION OWNERS (PTO), OVER WHICH THE ISO SHALL EXERCISE OPERATING AUTHORITY IN ACCORDANCE WITH THE TERMS SET FORTH IN THE TRANSMISSION OPERATING AGREEMENT (TOA), RATED 69kV OR ABOVE REQUIRED TO ALLOW ENERGY FROM SIGNIFICANT POWER SOURCES TO MOVE FREELY ON THE NEW ENGLAND TRANSMISSION SYSTEM. (OATT, II.49)

COMMON FACILITIES (NON-PTF):

VELCO FACILITIES THAT COMPRISE THE STATEWIDE, HIGH VOLTAGE TRANSMISSION GRID, INTERCONNECTING AND SERVING THE LOAD CENTERS OF THE STATE, AND ARE USED IN COMMON BY ALL PURCHASERS OF TRANSMISSION SERVICES ON A STATEWIDE BASIS. THIS INCLUDES FACILITIES CONSTRUCTED PRIOR TO 7-1-90, OR ANY SPECIFIC FACILITIES CONSTRUCTED AFTER 7-1-90 THAT HAVE BEEN RECLASSIFIED AS COMMON FACILITIES AS A RESULT OF BEING IN SERVICE FOR A PERIOD OF TEN YEARS.

SPECIFIC FACILITIES:

HIGH VOLTAGE LINES, SUBSTATIONS AND OTHER APPURTENANCES CONSTITUTING A DIRECT PHYSICAL CONNECTION TO THE VELCO (COMMON) TRANSMISSION SYSTEM AND ARE NOT PART OF THE LOOPED TRANSMISSION GRID. THESE FACILITIES ARE USED AND INSTALLED TO BENEFIT A REQUESTING PURCHASER OF TRANSMISSION SERVICE. IN THE CASE OF A SUBSTATION (STEPPING DOWN TO A LOWER VOLTAGE) THIS INCLUDES THE TRANSFORMER, HIGH SIDE CIRCUIT SWITCHER, BANK BREAKER, ANCILLARY DEVICES, CONTROLS AND CONTROL CIRCUITRY (REFER TO COMMON FACILITIES DEFINITION FOR CRITERIA OF RECLASSIFICATION).

EXCLUSIVE FACILITIES:

EQUIPMENT CONNECTED TO THE LOW VOLTAGE BUS, INCLUDING ANY ASSOCIATED PROTECTION, CONTROL, AND METERING SYSTEMS THAT HAVE BEEN CONSTRUCTED UNDER A VELCO WORK ORDER, AND ARE TO BE FULLY OWNED AND FUNDED BY THE PURCHASER OF TRANSMISSION SERVICE UPON COMMISSIONING. THIS TYPICALLY INCLUDES FOUNDATIONS AND STRUCTURES, BREAKERS AND SWITCHES, INSULATORS, LINE POTENTIAL TRANSFORMERS, CONDUIT, CABLE AND GROUNDING. ONGOING MAINTENANCE AND TESTING OF THESE FACILITIES ARE SUBJECT TO THE TERMS AND CONDITIONS OF VELCO'S SUBSTATION PARTICIPATION AGREEMENT.

SHARED FACILITIES (COMMON USE):

TYPICALLY CONSISTING OF EQUIPMENT LOCATED WITHIN SUBSTATIONS THAT ARE SHARED IN SOME MANNER FOR THE BENEFIT OF BOTH VELCO AND THE PURCHASER OF TRANSMISSION SERVICE. THIS INCLUDES STRUCTURES (BUILDINGS) AND IMPROVEMENTS, FENCING AND GATES, LOW VOLTAGE DISCONNECT SWITCHES, BUS WORK, LOW VOLTAGE POTENTIAL TRANSFORMERS (STATION SERVICE AND BUS POTS), COMPLETE STATION GROUNDING SYSTEMS, SUPPORTS AND CABLE TRAYS, BATTERIES AND CHARGERS, SWITCHSTICKS AND GLOWTECTORS, LADDERS, TABLES AND SUPPLY CABINETS. ONGOING MAINTENANCE AND TESTING OF THESE FACILITIES ARE SUBJECT TO THE TERMS AND CONDITIONS OF VELCO'S SUBSTATION PARTICIPATION AGREEMENT.

Anticipated Project Scope of Work

- Replace the existing control building with a larger control building
- Replace transformer high-side circuit switcher (220) with a circuit breaker
- Replace and expand the existing substation fence
- Maintenance related improvements
  - Replace the protection and control system
  - Replace AC and DC station service
  - Install power transformer and circuit breaker monitoring systems
  - Install transformer passive secondary oil containment system
  - Replace one (1), GMP Exclusive, 34.5 kV circuit breakers (X16)
  - Replace insulators and arrestors
  - Remove by-pass and ground switches
  - Repair concrete foundations and steel structures as necessary
  - Replace security systems
- Install temporary substation for temporary power during construction

St. Johnsbury Project Schedule

- Finalize Scope of Work – April 2023
- Seek VELCO Board of Director's approval to file 248 petition – April 2023
- File 45 day letter – May 2023
- File 248 petition - July 2023
- Receive 248 approval - January 2024
- Begin below grade construction - March 2024
- Commission project - March 2025

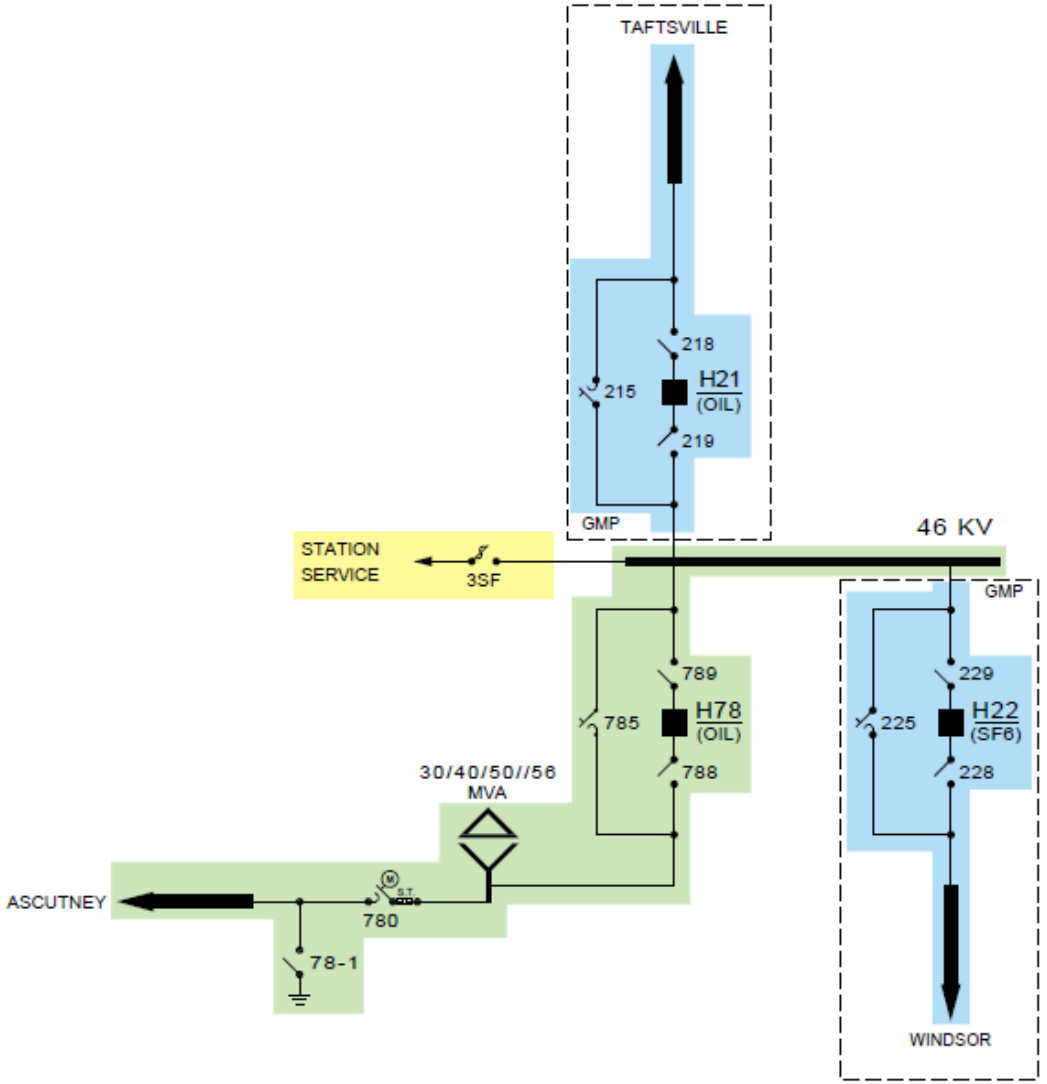
St. Johnsbury Cost Estimate (Level A)

- $12.9 Million (includes 50% contingency)

Windsor Substation

488 Hunt Road, Windsor, VT 05089

Windsor Facility Classification Diagram



Anticipated Project Scope of Work

- Replace the existing control building with a larger control building
- Replace and expand the existing substation fence
- Replace high side motor operated disconnect (solution to be determined)
- Maintenance related improvements
  - Replace the protection and control system
  - Replace AC and DC station service
  - Install power transformer and circuit breaker monitoring systems
  - Install transformer passive secondary oil containment system
  - Replace one (1), 115kV circuit breaker (H78)
  - Replace one (1), GMP Exclusive, 34.5 kV circuit breaker (H21)
  - Replace insulators and arrestors
  - Remove by-pass and ground switches
  - Repair concrete foundations and steel structures as necessary
  - Replace security systems
- Install temporary substation for temporary power during construction (under review)

Windsor Project Schedule

- Finalize Scope of Work – April 2023
- Seek VELCO Board of Director's approval to file 248 petition – April 2023
- File 45 day letter – July 2023
- File 248 petition - September 2023
- Receive 248 approval - March 2024
- Begin below grade construction – June 2024
- Commission project – July 2025

Windsor Cost Estimate (Level A)

- $13 Million (includes 50% contingency)