



FILED VIA ePUC

June 27, 2025

Holly R. Anderson
Clerk of the Commission
112 State Street
Montpelier, VT 05620-2701

Re: Case No. 25A-0742, Windy Ridge Geothermal Project – Revised Design

Dear Ms. Anderson:

By this filing, Vermont Gas Systems, Inc. (“VGS”) provides notice that we intend to use a portion of our innovation budget to support a geothermal project to heat and cool the Windy Ridge housing project in Hinesburg, Vermont (the “Project”). The Project is part of a new permanently affordable housing development that is being developed by Champlain Housing Trust (“CHT”). VGS submitted an initial notice related to this Project on April 16, 2025, which was proposed as a network geothermal system that would be supported by a substantial U.S. Department of Energy (“DOE”) grant. As detailed below, the Project is moving forward without the DOE grant and with the Revised Design described herein.

Our Alternative Regulation Plan provides that VGS “shall pursue and consider projects, programs, and services that support Vermont’s statewide energy goals by advancing promising technologies to facilitate efficient, lower carbon energy choices for Vermont customers.”¹ Section 9(e) requires VGS to provide 30 days’ advance notice to the Commission and the Department of Public Service (the “Department”) “before commencing any spending on a project, program, or service under the Climate Action and Innovation Budget that exceeds \$25,000.” As detailed below, spending on this Project is expected to exceed that threshold. Though the initial notice was allowed without further process, a new 30-day-advance notice period beginning on the date of this filing is appropriate because this filing includes significant funding and design changes.²

As noted, the initial Project design included a networked geothermal system that would be supported by a substantial DOE grant.³ Because of significant uncertainty as to whether the grant will ultimately be funded under the current federal administration, VGS and the developers have explored other ways to provide geothermal service to Windy Ridge customers. To maintain the construction timeline, mechanical designs must be finalized soon. Accordingly, the developer

¹ See Alternative Regulation Plan filed on October 26, 2023, in Case No. 22-5085-PET at 13.

² We note that the Department supported the Project in the original filing but conditioned its support on the availability of DOE grant funds, expecting that if the DOE grant funds became unavailable, VGS would submit a modified notice. See Department Recommendation, filed on May 16, 2025, in Case No. 25A-0742 at 2.

³ As detailed in that filing, the DOE was expected to fund 90% of a total project cost of \$3M. The DOE project was specific to a networked geothermal system and included elevated requirements for measurement and verification, increasing costs. While the grant has not been canceled, under the new administration the DOE has been unable to commit to a timeline for fund availability.

plans to rescind participation in the DOE grant in favor of the alternative design detailed in this filing.

Instead of a networked design, a more economical approach in the absence of the federal grant is to install single external loops for each building. In this design configuration (the “Revised Design”), there would be five loops installed, one for each multifamily building and one for each cluster of townhomes. VGS will own, operate, and maintain the ground loops, and believes that this configuration of the Project may be more replicable in future VGS-supported geothermal installations. This filing outlines more details about the Revised Design, including the costs and benefits of this proposal.

Details on the Revised Design – Subsection 9(f)(i)⁴

Windy Ridge is a new residential development planned in Hinesburg along Route 116 that is being developed by Champlain Housing Trust and Evernorth. The 46-acre parcel, located between the downtown area and Champlain Valley Union High School, was gifted to CHT in 2022.

This filing concerns the first portion of the Windy Ridge development, known as the South Meadow Neighborhood. As shown to the right, South Meadow will have five buildings, consisting of townhomes and apartments, totaling 44 permanently affordable units. CHT and Evernorth are the developers for South Meadow and construction is slated to begin in early 2026 and last for approximately twelve months.



Even without the DOE grant, CHT and Evernorth have continued to evaluate bringing geothermal to Windy Ridge to complement the permanently affordable housing that will be available to low-income Vermonters. As an alternative, they have accepted the Revised Design, described further below, developed by VGS in partnership with Dandelion Energy (“Dandelion”). Dandelion is a national leader in the geothermal industry, with a mission to replace fossil fuel HVAC systems with efficient, electric geothermal at scale, by driving down costs.⁵ Dandelion specializes in single-family and low-rise multi-family housing new construction. Since 2017, they have installed more than 3,000 ground source heat pumps and more than one million linear feet of ground loops. They are currently deploying systems in approximately 1,000 homes per year, with a goal to scale to 10,000 homes per year. To that end, they are partnering with a western housing developer on the largest geothermal deployment in the country—more than 1,500 homes in 24

⁴ The subsection numbers alongside headers cite to the relevant criterion required by Section 9 of VGS’s Alternative Regulation Plan.

⁵ For more information about Dandelion, see <https://dandelionenergy.com/>.

months.⁶ VGS has been in discussions with Dandelion for several years around how VGS might partner with Dandelion on deployment of geothermal systems. Windy Ridge presents the first opportunity for VGS and Dandelion to work together on such a project, and as discussed below, VGS believes there is great potential in a partnership with Dandelion to scale deployment of geothermal systems in new residential development in Vermont.

For Windy Ridge, the Revised Design entails vertically drilling approximately twenty boreholes, four for each building. High density polyethylene piping loops will be placed in each borehole. Each building will be served by its own ground heat exchanger (the geothermal borefield) that connects to the building's internal ground source heat pumps, located in the individual units and common spaces. The five geothermal borefields will be engineered to meet 100% of the South Meadow buildings' heating and cooling loads. VGS will fully own the ground loops and be responsible for their operation, maintenance, and performance. The heat pump equipment inside the buildings will be owned by the property owners.

Dandelion will design and install ground loops for VGS, supply the ground source heat pumps to the developers, and work closely with the developers' HVAC contractor to provide any technical assistance or training needed. Dandelion will also commission the system upon completion to ensure functionality. VGS will take ownership of the ground loops following commissioning.

While geothermal technical efficacy is well established, third-party infrastructure ownership allowing multiple property owners to use the renewable energy underground is an innovative approach to scaling this renewable, all-electric space heating and cooling solution.

Project Benefits and Cost/Benefit Analysis

Geothermal systems can significantly reduce greenhouse gas emissions and provide customers with affordable, efficient, and low maintenance heating and cooling. They are considered the most efficient heating and cooling systems available, and could enable decarbonized thermal services for residential, commercial, and industrial customers.

Unfortunately, aside from a few college campuses, geothermal utilization on a neighborhood scale does not exist in Vermont to date. There are three significant barriers preventing developers from adopting neighborhood geothermal systems. First, geothermal systems have high upfront costs due primarily to constructing the underground infrastructure. Second, developers are not familiar with the ground loop infrastructure and are therefore reluctant to take an ownership role or sell property in cases where they would be responsible for performance, operation, and maintenance. Third, as with any project providing community infrastructure, coordinating across multiple property owners introduces significant complexity. Challenges aligning diverse interests, managing capital contributions, structuring billing systems, and ensuring ongoing maintenance can quickly prevent otherwise promising projects from moving forward.

⁶ See Dandelion Energy and Lennar Announce One of the Largest Residential Geothermal Deployments in US History, available at <https://dandelionenergy.com/dandelion-energy-and-lennar-announce-one-of-the-largest-residential-geothermal-deployments-in-us-history>.

VGS is well positioned to support geothermal expansion in Vermont by developing pilot projects and facilitating deployment of geothermal at scale.⁷ Moreover, while unlocking barriers for developers and customers, offering a range of geothermal services could provide an alternative revenue source for VGS to help all ratepayers transition to a lower-carbon energy future.

VGS's participation in the Windy Ridge Project will advance geothermal as a low carbon energy choice for Vermont customers in several ways. It offers a unique opportunity for VGS, housing developers, customers, electric utilities, policymakers, and communities to understand and measure the benefits of geothermal systems. Specifically, the Project will provide the following diverse benefits:

For Our Natural Gas Customers and Employees: For VGS ratepayers, the Windy Ridge Project will kickstart VGS's geothermal service offering and test an alternative utility thermal model. We anticipate that geothermal projects will help diversify VGS revenue sources and support a cost-effective transition to a lower-carbon energy future. Further, the Project will provide VGS with valuable experience operating an alternative thermal infrastructure. VGS employees will gain hands-on training in geothermal system design, construction, and maintenance, building upon our employees' existing skill sets. This presents a potential growth path for VGS that is aligned with Vermont's climate goals.

Importantly, the Revised Design also represents a promising path for VGS to partner with Dandelion to bring geothermal systems to bear in residential new construction. Single-home or single-building geothermal installations may be a cost-effective thermal alternative for Vermont customers, particularly where developers or homeowners have pledged to provide all electric heating and cooling. From our discussions with Dandelion and preliminary financial analyses, we believe that other single-building geothermal installations, similar to what will be piloted at Windy Ridge, present an opportunity for VGS to own and operate ground loops, enabling customers to pay VGS for that service over time and avoid the upfront cost barrier to choosing geothermal. Our preliminary analysis indicates that market rate customers could provide full capital recovery to VGS, making this service cost neutral to our overall cost of service. Further cost/benefit analysis is included in the For Geothermal Customers subsection below.

For Homebuilders and Developers: The Project will demonstrate to customers and developers an all-electric heating and cooling solution with superior life-cycle costs and grid benefits as compared to the dominant all-electric solution, cold-climate air-source heat pumps. By demonstrating neighborhood-scale geothermal feasibility and benefits, the Windy Ridge Project

⁷ In July 2022, VGS provided notice to the Commission that we were conducting exploratory work for various geothermal projects. *See* correspondence of Jill Pfenning, dated July 29, 2022 in Case No. 22A-3045. In that filing, we discussed many geothermal system benefits and how utilities could play an important role in improving accessibility in Vermont. In our time pursuing geothermal service, we have assessed several potential projects inside and outside our natural gas footprint. Working with a diverse stakeholder group including town planners, developers, and geothermal system designers and installers, we have conducted feasibility studies for several multi-customer projects. The feasibility studies considered site geology, capital costs for constructing the ground loops, installation costs for the ground source heat pumps, and ensuing energy and maintenance costs for the end customer. The projects we explored ranged from large multi-family market rate apartment buildings to mixed residential development with permanently affordable apartments and townhomes.

will encourage adoption in other communities across Vermont. We know that developers are receptive to neighborhood geothermal systems in theory, but we have learned that where a neighborhood-scale development will ultimately involve multiple property owners, developers want a competent and responsive third-party operator. A utility serves this purpose well, just as it does for natural gas and electricity customers for whom regulation ensures safe, reliable, and affordable service over the long term. Currently, VGS is the only entity in Vermont offering to perform this third-party role and the Windy Ridge Project is our first opportunity to demonstrate success. Moreover, the Project site will be an educational tool, such that community members and interested parties can access tours and presentations on neighborhood geothermal system design, development, and operation.

In a market rate development, alternative all-electric heating solutions have generally focused on air source heat pumps, which have a lower initial capital cost,⁸ but higher operating costs. This solution has been favored to maintain lower capital costs, representing lower-cost, more accessible home prices. Under agreement with VGS, home builders could install more efficient geothermal heating systems without increasing the price of a home. New homeowners would make monthly payments to VGS to receive service from the geothermal loop. Initial analysis indicates that the cost of payments to VGS is offset by utility savings associated with the difference in operational cost between air source and ground source heat pumps. Geothermal competes favorably against some fossil fuels as well, and developments intending to use propane or oil for primary heat may benefit from a similar structure. In addition, there are various ancillary benefits such as space savings in mechanical spaces, lower utility infrastructure investment, and reduced peak electric demand. Many of these additional benefits have been evaluated in publicly available studies,⁹ however, we have not quantified these benefits for our analysis of this Project.

For Geothermal Customers: The Windy Ridge Project will provide residents with a dependable, highly efficient, cost-effective way to heat and cool their homes. The system is designed to supply 100% of the development's heating and cooling, offering a hassle-free

⁸ Feasibility studies conducted by VGS across several projects have consistently shown that the installed costs of interior equipment associated with air source heat pumps and ground source heat pumps are substantially similar. Therefore, the primary capital expenditure differential between the two is the ground loop necessary for geothermal.

⁹ See The Electric System Benefits of Thermal Networks at <https://static1.squarespace.com/static/65ef51da4920c9406def48df/t/67c5e43bfe16ee024c36a43c/1741022281941/HEETlabs+Synapse+Report+Avoided+Costs+Feb+2025.pdf>;

Electrical Grid Impact of Ground Source Heat Pump Technologies at <https://energy.maryland.gov/Reports/Electrical%20Grid%20Impact%20of%20Ground%20Source%20Heat%20Pump%20Technologies.pdf>;

The Economic Value of Ground Source Heat Pumps for Building Sector Decarbonization at [https://www.osti.gov/biblio/2224191](https://www.hrai.ca/uploads/userfiles/files/Dunsky_HRAI_Benefits%20of%20GSHPs_(2020-10-30)_F.PDF#:~:text=Ultimately%2C%20the%20original%20study%20concludes%20this%20transition,expensive%20scenario%20over%20the%20next%2030%20years.&text=If%20even%20one%20, and; Grid Cost and Total Emissions Reductions Through Mass Deployment of Geothermal Heat Pumps for Building Heating and Cooling Electrification in the United States at <a href=).

experience with reliable service, predictable costs, and year-round comfort. The geothermal system is quiet, combustion free, and does not require equipment mounted outside nor the running of refrigerant lines inside and outside the building. Windy Ridge will provide environmentally sustainable and permanently affordable housing to many renters and homebuyers in Chittenden County, an opportunity VGS, Champlain Housing Trust, Evernorth, and Dandelion hope to replicate for other Vermonters.

Comparing the costs and benefits for customers of a geothermal system illustrates the long-term value of this type of electrified heating. Evaluating alternatives, customers must consider not only the initial capital costs of the system, but also operation and maintenance costs, and replacement of major components over time. As noted above, generally, the interior equipment for air source and ground source systems is similar in initial cost, however, geothermal systems require an additional, one-time investment in the exterior ground loop. Conversely, air source systems have higher ongoing operating costs, and a shorter equipment life cycle, requiring the replacement of major components (i.e., compressors) more frequently. Comparing the present value of expected future costs for the air source and ground source systems for representative systems modeled by VGS has shown a lower total cost of ownership for the geothermal system.

This delta in valuation allows VGS to make the initial investment in the ground loop on behalf of a customer and recover that cost over time. In future deployments, VGS expects to identify scenarios where a customer's expected monthly cost of operation for the geothermal system, including any payments to VGS, is similar to or lower than the monthly operational cost of the alternative electric heating solution (most commonly air source heat pumps). In this specific project, tenants and homeowners at Windy Ridge will realize an incremental benefit due to the application of funding from VGS's Climate Action and Innovation program, which allows VGS to bring this technology to permanently affordable housing where the baseline heating choice may otherwise be chosen based on lowest cost without consideration for greenhouse gas benefits.¹⁰

For the Environment and Electric Grid: With no fossil fuels utilized for space heating, the geothermal system at Windy Ridge has been modeled to reduce carbon emissions by 27.6 metric tonnes of carbon dioxide ("MTCO₂e") annually, as compared to a natural gas heating system. Additionally, ground source heat pumps are significantly more efficient than other electrified heating and cooling systems; recent energy modeling shows an average 30% gain in efficiency over air source heat pumps.¹¹ Because geothermal systems provide a continuous, non-peaking electric load, they require less electricity to heat and cool buildings, and are generally immune from weather-induced commodity price volatility. As compared to air source heat pump solutions, geothermal systems at scale will place a lower demand on the electric grid, reducing the need for future electric generation, transmission, and related infrastructure.

¹⁰ Historically developers of affordable housing have selected HVAC design based solely on lowest cost of installation and operation. At Windy Ridge, VGS's natural gas system is immediately adjacent to the property, making natural gas available and inexpensive for the developers to connect.

¹¹ HeatLabs published an analysis in January 2025 finding that each thermal network lowered the electric peak for the connected buildings by 25% to 62%. See <https://www.synapse-energy.com/sites/default/files/Benefits%20of%20Thermal%20Energy%20Networks%20Presentation%2024-119.pdf>

Measurement and Verification: Once operational, VGS will monitor performance of the ground loops to ensure they are operating as designed. We will also evaluate the energy usage related to heating and cooling, and through energy modeling will compare this data against other all-electric heating and cooling alternatives, quantified in terms of customer costs and grid impacts. Ultimately, this data could provide us and others with information needed to consider future geothermal systems.

Cost – Subsection 9(f)(iv)

The overall cost of the Windy Ridge Revised Design installation is estimated to be \$2 million, which will be broken into two primary scopes of work: one for the inside equipment and one for the outside equipment, as detailed below. By this filing, VGS seeks to allocate approximately \$260,000 in capital from its Climate Action and Innovation Budget to support the Project. The total VGS spend will be approximately \$400,000, portions of which will come from third-party incentives, recoverable utility investment, and the Climate Action and Innovation Budget investment.

The first scope of work includes interior heat pump equipment that modulates interior air temperature by accepting and rejecting heat between the conditioned space and the glycol fluid circulating in the system. The estimated cost of interior equipment is \$1.6 million, which will be funded by CHT and Evernorth and recovered through rents or sales prices charged to tenants and homebuyers respectively. While CHT and Evernorth have not yet completed mechanical design, we believe this estimated cost is reasonably accurate based on the initial feasibility study for this Project, as well as prior estimates we have reviewed for similar projects. Dandelion will provide this equipment directly to CHT.

The second scope of work includes the exterior geothermal ground loop, which will include approximately four boreholes per apartment building or townhome cluster, as well as a small mechanical enclosure adjacent to each building. This system acts as a heat exchanger between the fluid within the system and underground geology, which generally remains at a stable temperature of approximately 50 degrees Fahrenheit year-round. VGS proposes to fund this second scope, which will be installed by Dandelion on a turnkey basis at a total expected cost of \$400,000.

VGS anticipates that the overall Project will receive incentives from Green Mountain Power, at a value of \$111,200 under Tier 3, and from Efficiency Vermont, which will contribute \$6,000 as an efficiency incentive. These incentives will be shared between VGS and CHT on a proportional basis based on each company's investment in the overall geothermal system. VGS expects the incentive portion applicable to construction of the geothermal loop (i.e., the portion within VGS's scope) to be approximately \$35,000 in total, which will be applied as a reduction against the \$400,000 installation cost.

Of the remaining \$365,000 within VGS's scope, VGS plans to recover approximately \$105,000 from customers over twenty years through a monthly fee. This amount was determined based on conversations with CHT related to utility cost affordability for the low-income residents served

by this development. On average, the loop charge VGS applies to apartments is expected to be approximately \$25 per month, while the charge applied to townhomes is expected to be approximately \$35 per month, a portion of which will cover the service provided by VGS to operate and maintain the loop itself. After establishing these monthly loop charges, VGS determined that such payments would recover approximately \$105,000 over the term.

VGS proposes to fund the remaining \$260,000 through the Climate Action and Innovation Budget as an Innovation Capital expense. Through our Alternative Regulation Plan, VGS has included \$1.5 million in Innovation Capital in rates during each year of the Plan. The rate impact for customers will therefore be no more than is already included in base rates through the Alternative Regulation Plan, which contemplates depreciation expense associated with the expected Innovation Capital expenditures. As accounted for in our current rate proposal for FY2026, the \$260,000 capital expenditure will be recovered in rates through depreciation expense (approximately \$13,000/year) in the coming years once the Project is put into service.

The tables below summarize expected capital flows within VGS's scope.

Financial Summary Table

Expected Ground Loop Installation Cost (VGS Gross Investment)	\$400,000
Expected Incentives (GMP/EVT), Allocation to VGS Scope	(35,000)
<i>VGS Net Investment (detail below)</i>	<i>\$365,000</i>

VGS Net Investment Detail

Capital Recovered from CHS/Homeowners (20-Yr. Term)	\$105,000
Contribution from VGS Climate Action & Innovation Budget	260,000
<i>VGS Net Investment</i>	<i>\$365,000</i>

Although there is no specific cost-effectiveness test for expenditures made under our Climate Action and Innovation Budget, VGS considers the cost of avoided carbon of a given investment and how it compares to the Vermont Climate Council's current value of the social cost of carbon, which is \$190/tonne as of this filing. VGS evaluates the cost of avoided carbon by dividing the total unrecovered incentive amount by the sum of the avoided carbon emissions over the expected life of the asset. In this case, VGS's Climate Action and Innovation Budget contribution is proposed to be \$260,000. The project is anticipated to avoid 27.6 metric tons of carbon emissions annually, over a service life for the ground loop of 50 years, resulting in a cost of avoided carbon of approximately \$188 per tonne.

Although Green Mountain Power will also contribute incentive funds to this Project under the Tier 3 program, VGS believes it is reasonable to consider the full carbon savings in determining the cost of avoided carbon with respect to its contribution. While Tier 3 and VGS's Climate Action and Innovation Program aim for similar customer outcomes, they have separate and distinct success measurements. The Tier 3 program bases compliance on a reduction in consumption of fossil fuel by a customer to whom an eligible measure is delivered. Neither 30 V.S.A. § 8005 nor Commission Rule 4.400 refers to carbon savings associated with Tier 3 program implementation or compliance, instead focusing specifically on reductions in fossil fuel

consumption, measured in MWh, a unit of energy rather than a unit of emissions. In contrast, VGS's Climate Action and Innovation Program under our Alternative Regulation Plan is defined to include "projects, programs, and services that support Vermont's statewide energy goals by advancing promising technologies to facilitate efficient, lower carbon energy choices for Vermont customers." While Tier 3 and VGS's Climate Action and Innovation Program may have similar outcomes, the program goals are specific and distinct from one another, allowing both programs to work in conjunction to facilitate new and innovative energy delivery systems to Vermont customers.¹² This brings to bear the greatest funding amounts available for new and innovative projects in furtherance of state energy goals.

Additionally, this project involves permanently affordable housing, which will serve low-income customers, a stated objective of VGS's decarbonization efforts and state policy. Not only does the Project avoid future use of fossil fuels for heating and cooling, it does so in a way that minimizes future electric utility cost by ensuring a highly efficient form of electric heating. The contribution required to support this Project, while justified by the cost of avoided carbon as discussed above, is further justified to promote climate action for Vermont's most vulnerable populations.

Timeline – Subsection 9(f)(v)

South Meadow at Windy Ridge is scheduled to break ground in January 2026 and be under construction for one year. In order to meet this timeline, VGS, CHT, Evernorth, and Dandelion would need to complete contracts between the parties by the end of July 2025. This would allow equipment to be ordered and installation to be scheduled in coordination with CHT and Evernorth's general contractor. CHT anticipates all units will be occupied and receiving service in early 2027. VGS would begin charging customers for ground loop service once the units are occupied.

Variance From Tariffed Services – Subsection 9(f)(vi)

VGS expects to collect a monthly fee from Windy Ridge customers who are provided geothermal service. VGS currently estimates that the fee will be approximately \$25/month for apartments in the multifamily housing buildings¹³ and \$35/month for the townhomes. The fee will include capital recovery over the twenty years of the agreement (the \$105,000 identified above) plus charges for operation and maintenance of the ground loop. Approximately 70% of the monthly fee will cover VGS's capital recovery, while approximately 15% will cover applicable taxes, including both income and property taxes. Finally, approximately 15% of the fee will be allocated to ongoing service costs, which encompass routine maintenance and

¹² See 30 V.S.A. § 8127(k)(1) (evidencing Clean Heat Standard policy's stance that Clean Heat credits could be obtained by measures "delivered and installed pursuant to any local, State, or federal program" including Tier 3, and that such measures "may count both towards goals or requirements of such programs and policies *and* be eligible clean heat measures" (emphasis added)).

¹³ CHT will retain ownership of apartment units, and therefore VGS will not charge renters directly. Instead, CHT will pay VGS at the aggregated level for the loop fees associated with CHT-owned buildings.

inspections of the geothermal loops, as well as administrative expenses incurred by VGS to provide this service to customers.

VGS will have customer agreements in place with CHT and Evernorth, in the case of the rental units, and with the homeowners in the case of the townhomes that are sold. The agreements will establish terms governing VGS's operation and maintenance of the ground loops in exchange for payment of the monthly fee. We expect the agreed-upon terms to be similar, where applicable, to those in our Commission-approved Terms and Conditions tariff, which among other things, governs billing, service quality, access, safety, and disconnection.¹⁴ Variance would exist where the gas service Terms and Conditions do not apply, like those specific to meter reading and other gas-specific facilities. VGS will also offer customers an optional service plan that would cover service and maintenance of the inside ground source heat pump equipment, not unlike service plans VGS offers today for equipment it installs and leases.¹⁵

Vermont Energy Goals and Greenhouse Gas Emissions – Subsection 9(f)(ii)

Vermont's 2022 Comprehensive Energy Plan directs the reduction of greenhouse gas emissions by 90% and fossil fuel consumption by 80% below 1990 levels, by 2050. Fossil fuel use in Vermont's existing building sector represents approximately 36% of our greenhouse gas inventory.¹⁶ A primary strategy articulated in the Comprehensive Energy Plan for the thermal sector is reducing thermal energy demand.¹⁷

The Environmental Protection Agency reports that geothermal heat pumps can substantially reduce energy use and emissions compared to air source heat pumps. By leveraging stable underground temperatures, geothermal systems also lower peak demand on the electric grid during extreme weather. The 2023 DOE report, *Grid Cost and Total Emissions Reductions Through Mass Deployment of Geothermal Heat Pumps for Building Heating and Cooling Electrification in the U.S.*, modeled a scenario in which geothermal heat pumps were installed in 68% of existing and new U.S. buildings, alongside weatherizing single-family homes from 2022 to 2050.¹⁸ The report projects this strategy would yield over \$1 trillion in cumulative electric cost savings, reduce consumer heating fuel bills by \$19 billion annually, and cut grid expansion needs by 38%, avoiding 43,500 transmission line miles. Additionally, electricity demand would decrease by 13%, and wholesale electricity prices would drop by 12%.

¹⁴ See VGS General Terms and Conditions at <https://vgsvt.com/service/rates/tariffs/>.

¹⁵ See VGS Service Programs at <https://vgsvt.com/service/programs/>.

¹⁶ See Energy Action Network, *Key Findings from the 2023 Annual Progress Report for Vermont*, available at: <https://eanvt.org/annual-report/2023-apr-key-findings/>.

¹⁷ See Vermont Department of Public Service, *2022 Vermont Comprehensive Energy Plan* at 164 (“achieving Vermont’s energy and climate-related goals will also require new strategies for further reducing thermal energy consumption across all the market segments”).

¹⁸ See <https://info.ornl.gov/sites/publications/Files/Pub196793.pdf>; see also *The Economic Value of Ground Source Heat Pumps for Building Sector Decarbonization* (2020) finding that “inclusion of more efficient ground-source heat pumps (GSHPs) provides an opportunity to reduce the overall costs and impacts of electrifying space heating in most parts of Canada,” available at [https://www.hrai.ca/uploads/userfiles/files/Dunsky_HRAI_Benefits%20of%20GSHPs_\(2020-10-30\)_F.PDF](https://www.hrai.ca/uploads/userfiles/files/Dunsky_HRAI_Benefits%20of%20GSHPs_(2020-10-30)_F.PDF).

South Meadow at Windy Ridge will be a new construction development with 44 permanently affordable housing units that do not utilize fossil fuel for space heating, with modeled greenhouse gas emissions reductions of 27.6 MTCO₂e annually. The Project plan includes evaluating the real-world geothermal system grid impacts against the modeled grid impacts of the alternative all-electric, air source heat pump. It is an ideal first step toward a very promising geothermal future.

Energy Efficiency – Subsection 9(f)(iii)

Both Efficiency Vermont (through its high-performance building program) and Green Mountain Power (through the Tier 3 program) are important partners supporting the Project's overall efficiency and decarbonization. VGS's EEU will not be involved unless there is gas service installed.

Customer Outreach – Subsection 9(f)(vii)

Our April 16th filing detailed the extensive community and customer outreach conducted in the years leading up to this Project. It is clear that many stakeholders see the potential benefits geothermal offers, but that a third-party facilitator is needed to design, build, own, operate, and maintain the underground infrastructure, particularly when multiple buildings and property owners are involved.

With regard to Windy Ridge, CHT will own the apartment buildings as rental units and will sell the townhomes. It will conduct outreach through its usual channels and VGS will not be involved in marketing the service to individual customers. However, we hope this pilot will help pave the way for more neighborhood geothermal projects, and we expect our experience at Windy Ridge will inform outreach to future developers and customers who might be interested in this service.

Conclusion

The Windy Ridge Project offers an exciting opportunity for VGS to explore how utility-owned and -operated geothermal can meet customer needs and support Vermont's clean energy goals. The Project will help VGS assess the training required to prepare its employees to install and maintain neighborhood-scale geothermal systems and identify the most practical and cost-effective ways to deliver them. It also provides a chance to study how geothermal systems interact with the electric grid, offering insights for future collaboration with electric utilities. The Project will give developers and community members hands-on experience with neighborhood geothermal systems, helping them gain confidence in geothermal's ability to reliably, comfortably, and affordably heat and cool homes and other buildings. It will be a blueprint for advancing a promising thermal energy alternative for our northerly state and a new revenue source for VGS and our ratepayers. The Revised Design presented herein—featuring the VGS/Dandelion partnership—presents a replicable path for residential development elsewhere in Vermont.

Holly R. Anderson, Clerk

June 27, 2025

Page 12

As always, we are available to the Commission and the Department to answer any questions about this filing.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mary G. Bouchard". The signature is fluid and cursive, with the first name "Mary" and last name "Bouchard" clearly distinguishable.

Mary G. Bouchard

Regulatory & Corporate Counsel

Vermont Gas Systems, Inc.

mbouchard@vermontgas.com