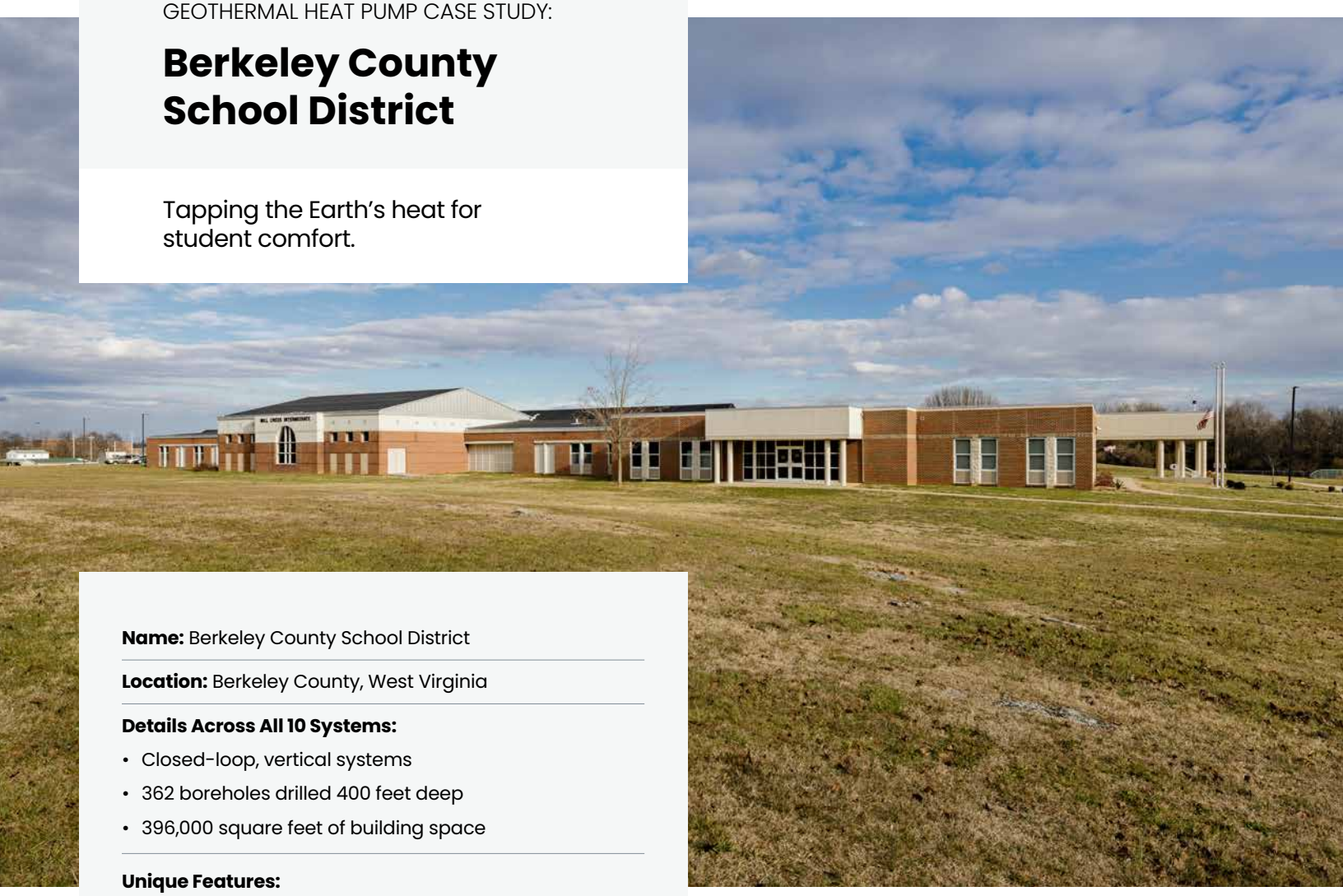
GEOTHERMAL HEAT PUMP CASE STUDY:

Berkeley County School District

Tapping the Earth's heat for student comfort.



Name: Berkeley County School District

Location: Berkeley County, West Virginia

Details Across All 10 Systems:

- Closed-loop, vertical systems
- 362 boreholes drilled 400 feet deep
- 396,000 square feet of building space

Unique Features:

- Outdoor air units recover energy from exhaust air
- Reused existing HVAC infrastructure to save on costs.

Energy Savings:

- 75% reduction in energy use across all 10 schools
- More than 31 million kWh per year for cooling
- 880,000 therms per year for heating

Cost Savings Per Year: $665,500 in energy and $106,500 in operations

Installation Specifics:

- 10 school building upgrades between 2016 and 2019
- Time to install: 8 weeks during summer breaks

Installation Costs: $23.4 million for 10 schools

Lessons Learned:

- Hire and train in-house HVAC staff to manage and maintain the systems
- Install controls that allow minimum adjustment by teachers in classrooms

Spring Mills Primary School is one of 10 schools in the Berkeley County School District upgraded to geothermal heat pump systems for heating and cooling. Impossible to spot, the system is installed beneath the grassy areas shown here. *Photo from CMTA, Inc.*

Geothermal Supports Optimal Learning Environments

When Manny Arvon, the former superintendent of the Berkeley County School District in West Virginia, had the opportunity to replace heating and cooling systems in 10 of the county's schools, he learned that geothermal heat pump (GHP) systems could reduce energy costs and system maintenance while improving energy efficiency.

But that's not even what sold him on geothermal. Because Manny was committed to providing optimum learning environments for the county's students, he especially liked geothermal's promise of quiet, comfortable, and reliable heating and cooling for the schools.

Providing an optimal learning environment. In addition to improved energy efficiency and lower maintenance costs, the geothermal heat pump systems installed in schools throughout Berkeley County School District provide comfortable, quiet learning environments for students and teachers. *Photo from CMTA, Inc.*

10 Schools, 27 Miles of Boreholes, Two Summer Breaks

With many of its schools more than 100 years old, the school district knew replacing aging heating and air conditioning systems was a top priority. The growing district could not afford to close any schools for renovations, however, and school schedules could not be disrupted.

The Berkeley County School District tackled these challenges by renovating all 10 schools over just two summer breaks. The concentrated timeframe required planning and coordination with various contractors but also helped keep costs down.

The projects were massive, with about 27 miles of boreholes drilled across 400 wells. Even so, the work was completed on time and the buildings were clean and ready for the first day of school.

A+ for Energy Efficiency and Year-Round Comfort

Berkeley County School District officials say the new geothermal heat pump systems substantially lessen background noise and improve indoor air quality. Thanks to these geothermal upgrades, **energy use in the 10 schools has been cut by 75%**.

> The geothermal heat pump systems we've installed in Berkeley County District Schools are so successful, we are planning to install them in three new schools. If you're thinking of installing a geothermal heat pump system, it should be a no-brainer. Go with geothermal.
>
> Ty Tyson, Executive Director of Maintenance & Facilities, Department of Maintenance, Berkeley County Schools

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Visit the Case Studies page to see more examples of geothermal heat pumps in action.

U.S. DEPARTMENT of ENERGY | Hydrocarbons and Geothermal Energy Office

For more information, visit:
www.energy.gov/eere/geothermal/geothermal-heat-pumps

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