



Sound Geothermal Corporation

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**Qualifications
And Reference Information
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Comfort from the ground up

GENERAL INFORMATION

Sound Geothermal is a Washington corporation, founded in 1997, consisting of an innovative design group focusing on various energy saving building technologies, primarily utilizing ground source heat pump or GeoExchange® systems. Our specialty is assessing the thermal resources of a site and utilizing those resources to design an innovative and cost-effective ground-coupled HVAC system. We also provide on-site and classroom IGSHPA certification training, fusion accreditation, and system inspection training. Our corporate professional affiliations include the Geothermal Heat Pump Consortium (GEO), International Ground Source Heat Pump Association (IGSHPA), Association of Energy Engineers (AEE), American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE), and the National Ground Water Association (NGWA).

Along with its Principals, SGT currently has five fully trained GX technicians that assist with design and field inspection. Of the technical staff, Mark Smith is a Certified Geoexchange Designer-in-training, Tonia Sulick-Bell is a LEED AP, and David Eckels is a Certified Energy Auditor. Additional information is available on request.

Supplemental to our design services, Sound Geothermal is also a supplier of products and technical services for GeoExchange (ground source heat pump), solar thermal, and high efficiency gas DHW and boiler applications. We supply heat pump equipment, polyethylene pipe, and other related products used for ground heat exchanger installation. Sound Geothermal Corporation is not an installing contractor.

TECHNICAL SERVICES

ME/PE Design Services - Many mechanical engineers are not experienced GeoExchange designers, but still wish to include this technology in their designs. SGT works closely with these engineers to provide ground loop design services that integrate with their mechanical systems. These services can be performed as a subcontract under either the Engineer or Architect.

In several States we can also provide complete ME/PE services through our Professional Engineering Partners, including errors & omissions coverage, for the complete mechanical design of any commercial GeoExchange application. The engineering firms we routinely work with are aware of proper load analysis and balanced loop design requirements to provide cost-competitive specifications.

Residential Design Services - Many contractors can generate their own heat loads and loop designs for general residential applications. However, for large custom homes and/or difficult or unique loop conditions or severe climate applications, we assist installation contractors with design services when they require support. Our residential services include ACCA Manual J heat loads, loop designs, pressure drop analysis for large common loop fields, equipment capacity parameters, system economics and installation specifications for combination forced air/hydronic/domestic hot water loads. SGT can also perform residential design and inspection services directly for homeowners, who can then provide the completed design package to a contractor.

Thermal Conductivity Testing – Sound Geothermal Corporation regularly provides onsite thermal conductivity testing services, as well as geological logging of the test boreholes, in order to evaluate the geothermal characteristics of a site. These testing services provide key design inputs for optimizing ground loop designs.

Commercial Loop Design Services – Sound Geothermal provides complete closed loop design services for commercial, institutional and industrial GeoExchange applications. We take the provided monthly cumulative heating and cooling loads, together with peak equipment capacities, usually supplied by the project engineer, and model the loop field for optimum efficiency and cost-effectiveness. Our loop models may be projected to future time intervals to confirm the avoidance of frost or heat bulbs, with augmentation of future impacts from changes in surface conditions (asphalt, greenways, etc.) or potential changes in subsurface conditions from aquifer changes, compaction, etc. Our loop designs include pressure drop calculations for the required total equipment flow and complete manifold specifications.

Construction Inspection Services – Sound Geothermal provides loopfield and water supply/injection well construction quality control inspections for both commercial and residential projects. These Ground Loop Heat Exchanger (GLHE) services may include drilling and grouting inspections, verifying manifold configuration and fusion quality, ground loop pressure and flow testing verification, and system startup validation. These services encourage best practices from installers, and provide peace of mind to owners.

System Start Up and Validation – Once the GLHE and GX heat pump is installed, SGT personnel are available to provide start-up and validation services to insure the system is working as designed. This may include control system verification, trend analysis, on-site inspection, and remote verification through the building control system's web portal.

Forensic Evaluation – Sound Geothermal provides independent evaluation services to trouble-shoot poorly performing or problematic installations, residential or commercial. In some cases, we can also provide onsite forensic TC testing of existing closed loops, vertical or horizontal, inclusive of the preliminary modeling and final system validation.

Design Software Assets

GLDesign Commercial	Geodesigner 3.1 (CLM)
GLDesign Residential Custom Extended	Bosch Select Tools
Lead+ Residential 5.0	Wrightsoft Suite Universal
GLHEPro 4.1	Binmaker Plus
LoopLink	AutoCAD 2013
GeoLink 2.1 (WFI)	PolySun
Bosch GeoSolutions	Bosch Solar Simulation

TRAINING SERVICES

IGSHPA Training – We offer IGSHPA installer certification courses throughout the United States, either as a contract training service to architects, engineers, manufacturers, distributors, contractors or utilities, or as self-sponsored courses in areas where we support active installation contractors. Our course outlines follow the standard syllabus required by IGSHPA; however, we expand as needed for the requirements of our students. We integrate the training from basic theory and fundamentals to include design, planning, implementation and commissioning from a field standpoint.

Certified GeoExchange Designer Training – Offered as needed to train CGD candidates.

Onsite Training – Sound Geothermal provides onsite training services for contractors and other professionals. This is usually scheduled around a residential or commercial system tie-in for a one-day school, while other training efforts are expanded to include the complete loop installation, headering, tie-in and commissioning of the equipment. We customize to the needs of the client.

First-Time Installer Support – For first time GeoExchange installers who purchase products through Sound Geothermal, we provide on-site supervision at cost.

KEY PERSONNEL

Cary Smith CGD, CEM, CEA – Cary is a founding partner, President, and CEO of Sound Geothermal Corporation. Prior to starting SGT, he was president of Applied Drilling Services Inc., a consulting petroleum engineering and business development firm with 29 years in the energy management industry. Cary has over 40 years experience in the fields of energy consulting, exploration and development, and energy systems design. His strong financial background has served a wide variety of petroleum industry, municipal, and industrial clients in successful energy related projects. Substantial experience in energy technology, GeoExchange system design, and financial management provides a great asset to the clients of Sound Geothermal. Cary is responsible for the majority of the large commercial and school designs in SGT's portfolio.

Skills and Certifications:

- Management
- Member ASHRAE
- ASHRAE TC 6.8 Secretary (voting)
- Member AEE, BOT – Utah Chapter, vice president
- AEE Certified Geo-Designer, (CGD) # 73
- AEE Certified Geo-Designer Trainer (CGDT)
- AEE Certified Energy Manager (CEM) #11288
- GHPC Geo-Merit Design Consultant
- IGSHA – Member Standards Committee, (Voting) Member
- IGSHA – Member Training Committee, (Voting) Member
- IGSHA Accredited Installer #15163-397
- IGSHA Certified Installation Instructor #T1095-398
- Past Board Member, Utah Geological Survey
- Ground loop design, custom and hybrid systems
- Operating cost analysis and evaluation
- Financing alternatives – project loans, leasing, and performance contracts
- Engineering design and expertise
- Existing system (forensic) evaluation
- On-site installation training
- Customized utility personnel training
- Technical consulting
- Email: dcsmith@soundgt.com

Marc Eckels – Geologist, founding partner, and Vice-President of Sound Geothermal Corporation. Marc's geologic expertise spans 40 years in the petroleum, geotechnical and geophysical fields. Marc is also a founding partner with Cary in ADS Operating, and is responsible for drilling program planning/management, well completion, field development, and geologic quality control. Marc has extensive operations management experience from the drilling industry including project development and marketing. Marc is currently COO of Wind River Exploration and consults to SGT. Marc's contributions include:

- Geologic evaluation of formations for proper loop design
- Marketing support
- Engineering design and expertise
- Project management
- Project planning
- Detailed project analysis specialist for schools, commercial and institutional applications
- Financing alternatives – project loans, leasing, and performance contracts
- Member SPE
- Member API
- Member AAPG
- Current Board Member, Utah State Geological Survey
- Email: marceckels@windrivercompanies.com

Donovan Brunner – Donovan has been an integral part of Sound Geothermal for 7 years. Donovan's prior work experience includes eight years of mechanical engineering experience in the HVAC industry working for Brunner & Dallon Professional Engineers as a HVAC and plumbing design specialist. Subsequent to that, he gained valuable sales and product management experience serving as the materials manager for a wholesale tire and wheel distributor. Donovan has a background in business management and has owned and operated multiple small businesses. Donovan earned his bachelors degree in Business Administration from the University of Utah. While working at Sound Geothermal, Donovan and Mark Smith have formed, and are currently operating, a geothermal installation company. Donovan's experience in sales, product management, design, and installation provide a unique perspective rarely found in the heat pump industry.

- IGSHPA Accredited Installer #15602-506
- WaterFurnace Service/Installation Training
- FHP/Bosch Service/Installation Training
- Equipment sales and support
- Dealer training and support
- After-sales support
- Project coordination and inspection
- Building HVAC system design and configuration
- Geothermal site and building analysis
- System Economic analysis
- Geothermal loop design
- In-situ formation thermal conductivity testing and geological logging
- AutoCAD rendering
- Email: donovan@soundgt.com

Mark A. Smith – Mark returned to SGT after serving three and one-half years in the Navy as a Corpsman. Prior to entering the Navy, he spent two years with Sound Geothermal as a technician; during this time Mark developed his knowledge through hands-on ground loop installations. He has also worked as a driller's assistant. For the past seven years he has been in charge of special projects for SGT. Mark has had extensive training in system loads, equipment for all product lines, solar specialties, hydraulics, heat pump operation, and system trouble-shooting. Mark is an accredited IGSHPA Installer, and with Donovan Brunner owns and operates a ground loop installation and geothermal services company. This combination of specialized training and extensive hands-on experience with both the ground loop and building mechanical systems has provided Mark with the skills to design and troubleshoot systems of all sizes. His primary duties currently include: commercial design, field inspection/validation, troubleshooting, and AutoCAD drafting. Mark is currently pursuing his CGD-IT certification.

- Accredited IGSHPA Installer #13631-1001
- Certified Geoexchange Designer in Training (CGD-IT)
- Member ASHRAE
- Accredited AutoCAD Technician #7838420000FY06
- WaterFurnace Service/Installation Training
- FHP/Bosch Service/Installation Training
- Bosch Solar Thermal Training
- Bosch Tankless Water Heater Training
- Heliodyne Solar Hot Water Installer Training
- GeoExchange system design, testing, inspection, and analysis
- Commercial system design including hybrid and community loops
- Engineering design and expertise
- Existing system (forensic) evaluation
- In-situ formation thermal conductivity testing
- On-site installation training
- Dealer training and support
- NATE Certified Proctor
- Email: masmith@soundgt.com

David N. Eckels – David first became involved in the geothermal industry in 1998; at the time he was the youngest person to receive IGSHPA accreditation. After earning a BA with honors in Anthropology from Dartmouth College, he worked as a Product Manager for an outdoor industry startup developing high-efficiency gas appliances. In 2008, David returned to geothermal and renewable energy with Sound Geothermal. David leads SGT's residential design and commercial site characterization efforts. He also supports SGT energy audits, and applies the auditor's mindset to design work. He enjoys helping customers understand how they can benefit from renewable energy. David lives with the technology, having recently installed a GeoExchange system in his own Salt Lake City home.

- NATE Certified / IGSHPA Installer #9877193
- AEE Certified Energy Auditor (CEA) #1792
- AutoCAD Certified #1RBLRBRBR42
- WaterFurnace Service/Installation Training
- FHP/Bosch Service/Installation Training
- GeoExchange system design, testing, inspection, and analysis
- GeoExchange geologic analysis and site characterization
- In-situ formation thermal conductivity testing and geological logging
- System economic analysis and evaluation
- Energy auditing
- Marketing support
- Project coordination
- Geothermal technology presentations
- Email: davide@soundgt.com

Nic Jones – Nic's experience includes eight years of installation and maintenance of mechanical equipment in the HVAC industry for RVJ Heating & Air Conditioning, and six years experience providing in-depth energy consulting services with Comfort & Energy Professionals, Inc. He has owned and operated his own small business for many years, and is currently pursuing his degree in Business Administration from the University of Utah (2013). His current responsibilities include: outside sales, dealer support, field inspection, system design, AutoCAD drafting, economic evaluation, and project coordination.

- Accredited IGSHPA Installer #17913-1008
- FHP/Bosch Service/Installation Training
- Accredited AutoCAD Technician
- Equipment sales and support
- Dealer training and support
- After-sales support
- Building HVAC system design and configuration
- Geothermal loop design
- Geothermal site and building analysis
- System Economic analysis
- Site Energy Analysis
- Project coordination and inspection
- In-situ formation thermal conductivity testing
- Email: nicjones@soundgt.com

Tonia Sulick-Bell – Nevada marketing and sales. Tonia has over 15 years of construction project management, design build, sustainable and HVAC system design experience working directly for owners, architects, engineers and contractors. Her broad portfolio of projects includes mega projects such as City Center and Echelon, government, hospitality, schools, water reclamation, and high-end residential. Tonia's experience also includes interning with Southern California Edison in cooperation with the Penn State University, where she obtained her bachelor's degree in Environmental Management and Engineering. Tonia has obtained her LEED AP, as well as become an instructor with the Construction Specification Institute in conjunction with the College of Southern Nevada for the Construction Document Technology program and certification.

- LEED AP
- LEED Document Control
- LEED Commissioning and Management
- Construction Document Technology Certification

- Construction Management
- Master Accredited Instructor for Construction Specification Institute
- Construction Document Technology Certification
- Green Advantage Certification
- Preconstruction and Budgeting
- Lorman Seminar Instructor for Preconstruction and Budgeting
- CSN/CSI Instructor for the Construction Document Technology Program
- Primavera trained and certified
- 2006 – 2007 Who's Who of Professional Women
- CSI Southwest Director Citation for commitment to sustainable construction education
- Member of the Construction Specification Institute
- Member ASHRAE
- Email: tonia@soundgt.com

Professional Associates (Example)

William (Bill) O'Donnell PE – Consultant; Owner, Quantum Group Engineering, PLLC

Bill is one of the most talented engineers with which Sound Geothermal has had occasion to work. Several of our most unique GeoExchange projects have been designed in partnership with Bill and his firm, inclusive of piloting our first multi-building distribution loop, the initial design of a distributed energy loop for over 600 homes and commercial sites, and the co-development of a forensic GeoExchange test. Bill held increasingly responsible mechanical engineering positions in project engineering, plant operations, maintenance, training and high-quality manufacturing processes for the Westinghouse Electric Corporation from 1973 to 1991. From 1991 to the present he has met numerous challenges as Manager of Quantum Group Engineering, PLLC. Assignments have included: commercial building design involving HVAC & R, geothermal heat pumps, plumbing and piping design, energy analysis and savings, indoor air quality and related engineering work. Bill specializes in designing hydronic heating and cooling systems utilizing the latest state of the art control systems, piping materials and high-efficiency equipment. These systems have included radiant floor heating and cooling, four pipe, four pipe/two pipe hybrids, and two-pipe, and geothermal heat pump radiant systems coupled to both ground source loops and wells. Bill is regularly contracted to perform evaluation and troubleshooting of under-performing plumbing and heating and cooling systems in order to optimize system performance.

Education / Training / Licenses / Memberships:

- B S - Mechanical Engineering, California Polytechnic State University - 1973
- IGSHPA Installation Certification School - 1997
- Registered Professional Engineer - State of Idaho- #4136
- Registered Professional Engineer - State of Colorado #37526
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) – Member
- International Ground Source Heat Pump Association (IGSHPA) – Member
- Email: reddog@ida.net

CURRENT WORK LOAD

Sound Geothermal Corporation's current work load is moderate and will or has met all project deadlines. Additional personnel and/or consultants are added based on the scope of work, project complexity, and the Owners needs.

PROJECT EXECUTION

The following is an outline of the normal progression and SGT's involvement with a given project. This list will expand or contract based on the Owner's needs and goals.

DESIGN PHASE

Scope of Work – Pre-Design Phase

This phase will entail pre-project evaluation as well as traveling to the site with the Drilling Contractor and/or Owner/General Contractor in order to verify the site conditions.

- Evaluate data provided by the owner regarding the feasibility and cost of the GeoExchange System. Provide preliminary budget and system life-cycle evaluation.
- Determine drilling and construction estimates with a Scope of Work that is easily modified for loop length and configuration. Present same to Owner for approval.
- Design and provide specifications for a Thermal Conductivity Test at the project site.
- Supervise the test drilling and log geological data/drilling operations data for the Thermal Conductivity evaluation and subsequent inclusion in the bid specifications and documentation.
- Conduct the Thermal Conductivity test and provide analysis of the results.

Scope of Work – Design/Execution Phase

- Meetings with the Owner and design team to confirm design parameters, heat loads, project scope and provide general "value engineering" recommendations.
- Provide revised anticipated system operating and maintenance economics.
- Provide anticipated construction budget for the loop field based on actual facility loads..
- Consultation with the ME (continuing through the project) specific to minimizing building energy use and integrating design of the building mechanical system with the ground source system.
- Review of ME's heat loads for entry into loop design program.
- Calculation and design of loop field size based on locally tested conductivity, deep earth temperature, and diffusivity.
- Provide suggested sizing of the GLHE for Owner/Architect/ME review and acceptance.
- Modification of peak cooling loads for loop program to compensate for hybrid equipment performance.
- Design of physical layout of loop field and presentation to Owner in AutoCAD 2012 format for inclusion in final drawings.
- Provide typical circuit drawings in AutoCAD 2012 format.
- Provide specifications for loop field construction.
- Provide sizing for related hybrid and pumping equipment for inclusion in Division 15 specifications based on borefield design.
- Provide typical mechanical non-vendor ground source heat pump specifications (Division 15) for use by ME in preparing their Division 15 specifications.
- Provide consultation with the ME and building control engineer to design a proper "sequence of operations" that will optimize the building performance.
- Meetings with the Owner, Architect, and ME for 95% design review.
- Modify design and specifications to conform with architect and ME final changes.

Minor additions or subtractions from this list are anticipated and included in the fee schedule.

CONSTRUCTION PHASE

Scope of Work - Construction Inspection

This Scope of Work involves inspecting the progress of the Drilling and Looping Contractor and the subsequent inspection and tests required for the Owner's Contractor to accept the Drilling/Looping Contractor's work.

- Coordinate loopfield drilling start-up with Drilling Contractor, Looping Contractor, and General Contractor.
- Work with the General Contractor to resolve any problems with the Drilling Contractor and/or site-specific issues.
- Visually inspect drilling, pipe installation, and grouting procedures.
- Provide a keyed Auto-CAD drawing with the borehole depths and summary of total emplaced loop length for review of specification compliance.
- Visually inspect fusion joints and manifolds for acceptable joints and lay-out compliance with the drawings.
- Witness flushing, purging, and system pressure tests.
- Verify flow parameters per IMC 1208.1.1
- Check bedding and backfill procedures.
- Provide the owner a final report detailing the above inspection results.
- Assist in building commissioning.

Minor additions or subtractions from this list are anticipated and included in the fee schedule.

POST-CONSTRUCTION PHASE

This phase consists of collecting and learning from the data that are produced from completed systems.

- Review real-time information collected by the building DDC system to assist in system performance evaluation, “tuning” the system, and possible building retro-commissioning.
- Incorporate completed system data into the design of future projects in order to further minimize first cost and optimize future system performance.

SUSTAINABLE DESIGN

Sound Geothermal Corporation is actively engaged in sustainable design projects and absolutely committed to the concept. We encourage and support continuing education of our employees and our design associates. Because of the nature of GeoExchange technology, it is an ideal fit into sustainable design programs. Approximately 50% to 60% of our clients, both commercial and residential, require that the project follow either Energy Star or LEED guidelines. We are currently an Energy Star partner. Our activities include working with state and local agencies and State Legislature(s) to design and adopt proactive sustainable and renewable energy policy(s).

For the past seven years SGT has been part of the design team for Clark County School District, Las Vegas, Nevada. The goal for the design team is to reduce Kbtu/∧ft. by 50%, minimize water use, significantly reduce building O & M cost, build schools and District facilities to LEED standards. There are currently five projects in varying stages of review.

Additional Sustainable Projects include: (Others upon request.)

Zion National Park Emergency Medical Facility
 Arches National Park Visitor Center
 NPS Central High School National Monument Visitor Center (Little Rock, AK)
 Dennison Elementary Montessori School (Denver, Colorado)
 Utah House 2000
 Salt Lake Wetlands Center (Platinum Certification goal)
 Daybreak Elementary School, Herriman, UT
 City of Salt Lake, Utah Clean Cities Program
 Whiteman AFB D GX/Steam Line retrofit.
 Garbett Homes (SLC, UT)
 Cashman Equipment, Las Vegas
 Colorado Mesa University (formally Mesa State College) Grand Junction, CO



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EXAMPLES OF SCHOOL AND COMMERCIAL APPLICATIONS BY SOUND GEOTHERMAL CORPORATION

Projects in **blue** type indicate that additional economic or performance information is available. The complete contact information is listed on a separate page following this list.

Additional commercial and residential projects and multiple building (community loop) projects are available upon request.

- TT** ASHRAE Seminar, 2007 Dallas Winter meeting.
- TT2** ASHRAE Seminar, 2008 New York winter meeting.
- TT3** ASHRAE Seminar, 2011 Las Vegas Winter meeting.
- TT4** ASHRAE Seminar, 2008 Salt Lake City Summer meeting.
- TT5** ASHRAE Winter meeting 2011 Presentation (Community GX Systems)
- PPT** Power point presentation with additional economic or performance available.

Cold Weather Schools– (Net Heating btu/yr) 100% Ground Loop

- 1999 - Neola Elementary school, Neola, Utah individual units, forced air, Uintah Basin, Utah – 70 tons, 34,161 ^ft. Vertical and horizontal combination closed loop.
Duchesne County School District – Tony Grant
Professional Engineering Services – Ray Moore (Engineer designed loop, SGT managed the project.)
- 2001 - Dennison Elementary Montessori School, Denver, Colorado, Vertical Loop – Energy Star >95%
Abeya Engineering Consultants, Inc. – Monty Abeya
- **PPT** 2001 – Canyon View High School, Cedar City, Utah – 625 tons, 233,200 ^ft. closed vertical loop.
Naylor-Wentworth-Lund Architects – Ken Naylor
Olsen & Peterson Consulting Engineers, Inc. – Cory Greenwell
- 2004 – Davis County School District, Utah – Sand Springs Elementary, 183 Tons, Vertical Closed Loop – schools 73,255 ^ft,
Davis County School District - Gary Payne
Valentiner–Crane-Brunjes-Onyon Architects - Peter Brunjes
Spectrum Engineers - Randall Logan P.E.
- 2004 - 2005 – Jordan School District, Sandy, UT, Peruvian Park Elementary Renovation- Spring 2006, Vertical Loop
Jordan School District - Duane Devey
MHTN Architects - Bruce Barnes
Olsen & Peterson Consulting Engineers, Inc. – Mitch Tervort
- **TT-PPT** 2004 – Jordan School District, Sunset Ridge Middle School - 195,254 ^ft, 419 tons with snowmelt.
Jordan School District - Duane Devey
Valentiner-Crane-Brunjes-Onyon Architects - Peter Brunjes
Olsen & Peterson Consulting Engineers, Inc. – Mitch Tervort

- 2007 – New Valley High School, Jordan School District, Utah, Vertical Loop.
Jordan School District – Duane Devy
Naylor-Wentworth-Lund Architects – Ross Wentworth
Olsen & Peterson Consulting Engineers, Inc. – Jeff Seere
- 2007 – Eastlake Elementary, Jordan School District, Utah, Vertical Loop.
Jordan School District – Duane Devy, Carl Patterson
Olsen & Peterson Consulting Engineers, Inc. – Mitch Tavort
- 2010- Present – Herriman II Middle school, Vertical Loop 400 tons – Under construction.
- 2011 – Jordan School District, Ft. Herriman Middle School #2 Re-site of the 2004 Herriman Middle School #1 - 189,651 ^ft, 409 tons, (Hybrid) with snowmelt.
Jordan School District - Duane Devey
MHTN Architects - Bruce Barnes
Olsen & Peterson Consulting Engineers, Inc. – Jeff Seare

Hybrid/Ground Loop (Fluid Cooler and/or Boiler)

- ^{PPT} 2002 - Murray High School, 250,000^ ft. Salt Lake City, UT, 635 tons, closed vertical loop, hybrid fluid cooler.
Naylor-Wentworth-Lund Architects – Ken Naylor
Olsen & Peterson Consulting Engineers, Inc. – Cory Greenwell
Murray City School District – Rod Pace
- 2004 – Davis County School District, Utah –North Davis Junior High School and Aquatic Center – schools 260,000^ft, 705 tons (Hybrid System)
Davis County School District - Gary Payne
Naylor-Wentworth-Lund Architects – Ross Wentworth
Olsen & Peterson Consulting Engineers, Inc. – Cory Greenwell
- 2004 – Davis County School District, Utah –Syracuse High School, 260,000^ft, 521 tons, (Hybrid System).
Davis County School District - Gary Payne
Valentiner-Crane-Brunjes-Onyon Architects - Peter Brunjes
Spectrum Engineers – Wade Bennion
- ^{TT-PPT} 2004 – Jordan School District, Daybreak Elementary and Community Center (LEED Standards) – 116,684 ^ft, 250 tons (Hybrid) with snowmelt.
Jordan School District - Duane Devey
Brixen & Christopher Architects - Andrew Ramsay AIA
Heath Engineering Company - Jeff Anderson
- ^{TT-PPT} 2004 – Jordan School District, Ft. Herriman Middle School - 189,651 ^ft, 409 tons, (Hybrid) with snowmelt.
Jordan School District - Duane Devey
MHTN Architects - Bruce Barnes
Olsen & Peterson Consulting Engineers, Inc. – Mitch Tervort

Large or Unique Commercial Applications:

- 1997 – Ute Tribe Wildlife Center, Ft. Duchesne, UT. First Ground Source application on Tribal Land. ~20 tons.
- 2003 – Ute Tribal Housing Project, Ft. Duchesne, UT. 10 units ~30 tons. Retrofit new modular housing. Trained Tribal members to do light service and installation work.
- 2003 – Ute Elderly Housing 8 units ~25 tons. The system added low cost heating and air conditioning to the Elderly Housing project
- 2004 – Stampin'-UP 600 tons Hybrid – Salt Lake City Utah – 200,000 sq. ft packaging, shipping, corporate offices with expansion design.

- 2005 – 2006 – Thai Properties dual towers, Thanksgiving Point. Double hybrid – GX loop with Boiler and Cooling tower. System is designed to handle 90% of all heating and cooling with GX system.
- 2007 – Present - Colorado Mesa University (CMU), Grand Junction, CO - Central Loop project. We are currently in the process of designing the second circuit of the Central Loop System. This will add capacity for an additional 2,100 tons of heating/cooling capacity to the distributed energy project.
- 2012 – Present – Preliminary design Ute Indian Tribe Correctional Facilities, Shelter Housing, and Justice Center (700 Tons-Hybrid)

Community Hybrid GX Systems: Uintah Basin Medical Center

- [PPT 2002 - Uintah Basin Medical Center \(UBMC\), Physician's Clinic, Roosevelt, UT 30,000^ft., 100 tons, Hybrid with chiller return pre-cooling.](#)
- 2008 New 60,000^ft UBMC Extended Care Facility. – Add community loop design to interconnect with future buildings and Physicians Clinic (2002 above). Add new 60,000^ft Physician's Clinic (2008), Physical Therapy Building, Main Hospital OB addition (2007 – 2008).
- 2009 – Present UBMC Campus - Begin construction of central loop system to link Both Medical Office Buildings, Extended Care Facility, and the Main Hospital.
- [2009 New 48,000 Uintah Basin Medical Center Medical Office Building \(MOB\) #2. This project includes the central plant to link multiple existing and future buildings in a Central GeoExchange loop. At present the project includes MOB #1, MOB #2, West Hospital Wing, and Extended Care Facility – Total 155,000^ft., ~550 tons](#)

Kennecott Land Development – Large-scale housing development feasibility study.

- 2005 – 2006 – Kennecott Land Development Daybreak Projec, Herriman, UT - Communal loop system, Hybrid, Lake, Irrigation, Cooling Tower, Boiler, Ground loop – Integrated system – Design Development.

Whiteman Air Force Base

- 2005 – 2006 – Whiteman AFB Missouri, Community loop - Temporary Living quarters, Communications facilities, Office, Storage, Mechanical bays. Community Loop System.~950,000^

Colorado Mesa University (Mesa State College)

- [PPT & PPT – TT3 – TT5 2007 - Present Mesa State College, Grand Junction Colorado, Design New Classroom building, Hybrid. Design North Avenue Dorm, Design Grand Mesa borefield Design development of Community Loop system for 1,700 to 2,500 connected tons, eleven buildings, ~980,000 sq.ft. Central Loop system is under commissioning. Two dorms, Houston Classroom, ACB Classrooms, Wubben/Science Center, Student Union. 18" Central Loop Pipeline. Ground loop, existing boilers, existing and new cooling towers.](#)
- [2012 Begin design of new NW extension \(18" pipeline\) of the Central Loop to pick up new Renaissance Dormitory complex and classroom buildings. Plan the addition of 1,800 to 2,100 tons of new construction.](#)

Clark County School District Buildings, Las Vegas Nevada

- [PPT 2004 – North West Career and Technical Center \(High School\), Clark County School District, Las Vegas, Nevada. ~ 219,000 ^ ft \(LEED & Hybrid\)\) 680 tons.](#)
- [PPT 2006 – East Career and Technical Center \(High School\), Clark County School District, Las Vegas, Nevada. ~ 219,000 ^ ft \(LEED & Hybrid\)\) 680 tons. Five buildings](#)
- [PPT2007 Clark County School District Nevada; Veteran's Tribute CTA, 220,000^ft. five building community loop > 450 tons. Hybrid ground loop - cooling tower.](#)

- ^{PPT} 2008 Clark County School District, Nevada; SW CTA, 220,000^ft. seven building community loop > 600 tons.
- 2008 Clark County School District, Nevada; W CTA, 220,000^ft. seven building community loop > 600 tons.

Nye County School District, Nevada

- 2009-2012 Nye County School District, Pahrump High School Campus, preliminary design of central loop and loopfield. (Five buildings >800 tons) Hybrid ground loop, boiler, cooling tower.
- 2010-2011 Nye County School District, Manse Elementary School, high efficiency heat pumps hybrid with tower.

Las Vegas Motor Speedway

- 2007 – Las Vegas Motor Speedway, Speedway Motor Sports (Hybrid) Media Center and Driving School 350 tons
- 2008/09 - Las Vegas Motor Speedway, Speedway Motor Sports (Hybrid) Trophy Towers 1,000 tons – design development. To integrate with existing ground source system.
- 2012 – Las Vegas Motor Speedway, Exotic Racing Facilities (design development)

Cashman Equipment

- ^{PPT - TT3} 2008 - 09 – Cashman Equipment Henderson, NV Facility, Cashman Equipment, Las Vegas, Nevada. ~ 390,000 ^ ft (LEED & Hybrid)) 1,200 tons. Multi Building Community Loop

OTHER Hybrid and Warm/Hot Weather Facilities hybrid/Ground Loop (Fluid Cooler and/or Boiler)

- ^{PPT} 2002 - Murray High School, 250,000^ ft. Salt Lake City, UT, 635 tons, closed vertical loop, hybrid fluid cooler.
Naylor-Wentworth-Lund Architects – Ken Naylor
Olsen & Peterson Consulting Engineers, Inc. – Cory Greenwell
Murray City School District – Rod Pace
- 2003 - Duchesne High School, 106,800^ft., Duchesne, UT, 250 tons, open loop pump and dump and closed loop horizontal drilling – hybrid/boiler. Energy Recovery Ventilation
Duchesne County School District – Tony Grant
Naylor-Wentworth-Lund Architects – Ross Wentworth
Professional Engineering Services – Ray Moore
- 2003 – Duchesne County School District, Tabiona School, 55,000+ sq.ft., Tabiona, UT, 200 tons, horizontal drilling closed loop and boiler. Retrofit – includes Energy Recovery Ventilation
Duchesne County School District – Tony Grant
Professional Engineering Services – Ray Moore
- 2003 – Millard County School District, Delta Elementary, Delta, UT, 55 tons, Vertical GX with Boiler & Fluid Cooler Hybrid
Millard County School District - Kendall Dewsnup
Siemens Building Technologies - John Harrington
Van Boerum and Frank Assoc. - Benjamin Davis
- 2003 – Millard County School District, Fillmore, UT, Fillmore Middle School, 150 tons, Vertical GX with Boiler & Fluid Cooler Hybrid.
Millard County School District - Kendall Dewsnup
Siemens Building Technologies - John Harrington
Van Boerum and Frank Assoc. - Benjamin Davis
- 2004 – Davis County School District, Utah –North Davis Junior High School and Aquatic Center – schools 260,000^ft, 705 tons (Hybrid System)
Davis County School District - Gary Payne
Naylor-Wentworth-Lund Architects – Ross Wentworth
Olsen & Peterson Consulting Engineers, Inc. – Cory Greenwell

- 2004 – Davis County School District, Utah –Syracuse High School, 260,000^ft, 521 tons, (Hybrid System) Under Construction.
Davis County School District - Gary Payne
Valentiner-Crane-Brunjes-Onyon Architects - Peter Brunjes
Spectrum Engineers – Wade Bennion
- TT-PPT 2004 – Jordan School District, Daybreak Elementary and Community Center (LEED Standards), Herriman, UT – 116,684 ^ft, 250 tons (Hybrid) with snowmelt.
Jordan School District - Duane Devey
Brixen & Christopher Architects - Andrew Ramsay AIA
Heath Engineering Company - Jeff Anderson
- TT-PPT 2004 – Jordan School District, Ft. Herriman Middle School #1 - 189,651 ^ft, 409 tons, (Hybrid) with snowmelt.
Jordan School District - Duane Devey
MHTN Architects - Bruce Barnes
Olsen & Peterson Consulting Engineers, Inc. – Mitch Tervort

HOT WEATHER SCHOOLS – (Net Cooling btu/yr)

100% Ground Loop

- 2002- Centennial Independent School District, Centennial, AZ, Masada Charter School, 50 tons, Vertical Loop
Masada Charter School
Basic HVAC - David Berg
- 2003 – Littlefield School District, Littlefield AZ, Beaver Dam Elementary Addition, Convert Vertical Loop to Hybrid to accommodate new addition.
Littlefield Unified School District - Dr. Joe Trujillo
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder

Hybrid/Ground Loop (Fluid Cooler)

- 2002 - Santa Clara intermediate School, Santa Clara, UT 150,000+ sq.ft., St. George, UT, 350 tons, closed vertical loop, hybrid fluid cooler.
Washington County School District - Luwayne Barber
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder
- 2002 - Washington County School District, St. George Utah, Santa Clara Intermediate, Vertical Hybrid.
Washington County School District - Luwayne Barber
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder
- 2003 – Littlefield School District, Littlefield, AZ, Beaver Dam High School, Vertical Hybrid 42,000 ^ft.
Washington County School District - Luwayne Barber
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder
- 2003 – Washington County School District, St. George Utah, Pine View Intermediate School, 315 tons, Vertical (Hybrid).
Washington County School District - Luwayne Barber
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder
- 2003 – Washington County School District, St. George Utah, Fossil Ridge Elecentary, 97 tons Vertical Hybrid.
Washington County School District - Luwayne Barber
Naylor-Wentworth-Lund Architects – Ken Naylor
Van Boerum and Frank Assoc. – Rich Reeder

- **PPT** 2004 – Career and Technical Center (High School), Clark County School District, Las Vegas, Nevada. ~ 210,000 ^ ft (LEED & Hybrid)) 680 tons, under construction.
 Clark County School District - Eric Heinicke
 SH Architecture - Mark McGinty AIA
 MSA Engineering Consultants - Ron Edwards
- 2005 – Lummis Elementary School, Clark County School District, Las Vegas, NV - Retrofit (Hybrid System), Bids January 2006.
 Clark County School District - Eric Heinicke
 SH Architecture - Mark McGinty AIA
 Harris Consulting Engineers - Kent T. Bell PE
- **PPT** 2005 - Burkholder Middle School, Clark County School District, Las Vegas, NV - (LEED and Hybrid), 450 tons- 95% design review.
 Clark County School District - Eric Heinicke
 SH Architecture - Mark McGinty AIA
 MSA Engineering Consultants - Ron Edwards
- 2006 – Las Vegas Motor Speedway, Speedway Motor Sports (Hybrid) Media Center
 350 tons – under construction
 Speedway Motor Sports – John Zudel
 ai Architecture – Brad Schwartz
 Behade Construction – Paul Dean
- 2006 - Las Vegas Motor Speedway, Speedway Motor Sports (Hybrid) Trophy Towers
 1,000 tons – design development
 Speedway Motor Sports – John Zudel
 ai Architecture – Brad Schwartz
 Behade Construction – Paul Dean
- 2006 – Career and Technical Center (#2) East (High School), Clark County School District, Las Vegas, Nevada. ~ 210,000 ^ ft (LEED & Hybrid)) 680 tons, Under construction.
 Clark County School District - Eric Heinicke
 SH Architecture - Mark McGinty AIA
 MSA Engineering Consultants - Ron Edwards

Products That We Represent by State/Region

Sound Geothermal offers a full line of geothermal, renewable energy and efficiency products to meet the needs of your individual project. We pride ourselves in being able to provide you a cost-effective line of energy efficient, renewable technologies. We have chosen to specialize in geothermal (ground source) and other renewable technologies, and as such, we understand the subtle equipment and project distinctions that many large-scale supply chains do not appreciate.

Utah / Eastern Idaho / Western Wyoming

Commercial Heat Pumps: Florida Heat Pump / Bosch (FHP)

Residential Heat Pumps: WaterFurnace

Heat Exchangers, Plate and Frame / Brazed Plate: Polaris

Solar Collectors: Bosch

Boilers: Buderus / Bosch

Tankless HW: Bosch

PV Collectors: Bosch

Hose Kits: Hays, Chamberlain, FlowCon

Energy Recovery Ventilator: RenewAire

Flow Center / Pump Stations: Geo-Flo, Flow Center

Grout and Sand: GeoPro

Geothermal Pipe: Centennial Plastics

Geothermal Fittings: B&D

NEVADA

Residential and Commercial Heat Pumps: Bosch / FHP and WaterFurnace

Heat Exchangers, Plate and Frame / Brazed Plate: Polaris

Solar Collectors: Bosch

Boilers – Buderus: Bosch

Tankless HW: Bosch

PV Collectors: Bosch

Hose Kits: Hays, Chamberlain, FlowCon

Energy Recovery Ventilator: RenewAire

Flow Center / Pump Stations: Geo-Flo, Flow Center

Grout and Sand: GeoPro

Geothermal Pipe: Centennial Plastics

Geothermal Fittings: B&D

NATIONWIDE

Grout and Sand: GeoPro

Geothermal Pipe: Centennial Plastics

Geothermal Fittings: B&D



Bosch Group

