



GWA Research, LLC  
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Lyme, NH 03768  
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NHPUC 17FEB'15PM1:17

11 February 2015

Debra Howland  
Executive Director  
State of New Hampshire  
Public Utilities Commission  
21 S. Fruit St, Suite 10  
Concord, NH 03301-2429

RE: Application to Qualify as an Independent Monitor

Dear Ms. Howland:

Please find the subject application attached. In addition to my qualification as a registered Professional Engineer in New Hampshire, I believe you will find that I'm extremely well qualified for this task from my career long involvement in performance monitoring of both district heating systems as well as geothermal heat pumps. In conducting these performance studies I made many thermal and electric measurements. I have attached a Resume for your reference.

Should you have any questions regarding my application please contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gary Phetteplace", with a long, sweeping horizontal line extending to the right.

Gary Phetteplace, PhD, PE



# State of New Hampshire Public Utilities Commission

21 S. Fruit Street, Suite 10, Concord, NH 03301-2429



## APPLICATION TO QUALIFY AS AN INDEPENDENT MONITOR

### TO VERIFY ELECTRICITY OR USEFUL THERMAL ENERGY PRODUCTION FROM ELIGIBLE CUSTOMER-SITED SOURCES\*

This independent monitor application must be filed with the Executive Director of the New Hampshire Public Utilities Commission (Commission).\*\* *The completed original application, as well as two copies and a cover letter requesting certification should be sent to:*

Debra Howland  
Executive Director  
State of New Hampshire  
Public Utilities Commission  
21 S. Fruit St, Suite 10  
Concord, NH 03301-2429

An electronic version of the docket filing should be submitted to [executive.director@puc.nh.gov](mailto:executive.director@puc.nh.gov) and [barbara.bernstein@puc.nh.gov](mailto:barbara.bernstein@puc.nh.gov). Contact Barbara Bernstein by email or phone 603-271-6011 with questions.

***Any omissions and/or deficiencies which need to be corrected must be completed in a timely manner or the Commission may close the application process without prejudice.***

\*Pursuant to New Hampshire Administrative Code [Puc 2505.09](#)

\*\*Pursuant to [Puc 202](#)

### Please complete the following:

Applicant Name:	Gary Phetteplace				
Business Name:	GWA Research LLC				
Mailing Address 1:	7 Masa Morey Lane				
Mailing Address 2:					
Town/ City:	Lyme	State:	NH	Zip Code:	03768
Telephone:	603-795-4920	Cell:	603-325-0020		
email	garyp@gwaresearch.com				












<b>2505.09</b>	<b>Independent Monitors</b>
2505.09(a)	<i>An independent monitor shall verify the <u>electricity</u> production of a customer-sited source or the production of <u>useful thermal energy</u> from an eligible source and report such production and REC calculation to the GIS.</i>
2505.09(b)	<i>A distribution utility shall be eligible to serve as an independent monitor for customer-sited sources and sources producing useful thermal energy within its service territory, provided that the distribution utility employs one or more persons to perform monitoring tasks who meet the qualifications specified in paragraph (c) or (d). (See below).</i>

As **ATTACHMENT A**, please provide a copy of the license issued by the state of New Hampshire or such other qualifying certification as may be applicable.

	<b>Electrical Production Independent Monitors</b>	
2505.09(c)	<i>To qualify as an independent monitor who verifies <b>electrical production</b> please indicate which of the following apply to the applicant:</i>	
2505.09(c)(1)	An electrician licensed by the state of New Hampshire and in good standing.	<input type="checkbox"/>
2505.09(c)(2)	A professional engineer licensed by the state of New Hampshire and in good standing.	<input checked="" type="checkbox"/>
2505.09(c)(3)	A certified building analyst professional or a certified mechanical professional as certified by the Building Performance Institute, Inc. of Malta, New York.	<input type="checkbox"/>
2505.09(c)(4)	A certified energy manager as certified by the Association of Energy Engineers.	<input type="checkbox"/>
2505.09(c)(5)	A home energy rater as certified by Residential Energy Services Network (RESNET)	<input type="checkbox"/>
2505.09(c)(6)	Certified as an independent monitor under a renewable portfolio standard program in another state.	<input type="checkbox"/>

	<b>Useful Thermal Energy Independent Monitors</b>	
2505.09(d)	<i>To qualify as an independent monitor who verifies <b>useful thermal energy production</b> please indicate which of the following apply to the applicant:</i>	
2505.09(d)(1)	A professional engineer licensed by the State of NH and in good standing.	<input checked="" type="checkbox"/>
2505.09(d)(2)	<b>For verification of useful thermal energy from solar thermal sources</b> , a North American Board of Certified Energy Practitioners (NABCEP) Certified Solar Heating Installer	<input type="checkbox"/>
2505.09(d)(3)	<b>For verification of useful thermal energy from geothermal sources</b> an International Ground Source Heat Pump Association (IGSHPA) Accredited Geothermal Installer	<input type="checkbox"/>

Provide your initials as an indication that you have read the following as it pertains to Independent Monitors and agree to uphold the rule.		Initials
2505.09(a)	An independent monitor shall verify the production of a customer-sited source or the production of useful thermal energy from an eligible source and report such production and REC calculations to the GIS. Such a customer-sited source or a source producing useful thermal energy shall either retain the services of an independent monitor directly or, if participating in aggregation pursuant to Puc 2506, through an aggregator.	
2505.09(b)	A distribution utility that is a distribution company shall be eligible to serve as an independent monitor for customer-sited sources and sources producing useful thermal energy within its service territory, provided that the distribution utility employs one or more persons to perform monitoring tasks who meet the qualifications specified in paragraph (c) or (d).	
2505.09(g)	No customer-sited source or source producing useful thermal energy shall use an independent monitor: <ul style="list-style-type: none"> <li>• who is a member of the immediate family of the owner of the source, or,</li> <li>• who holds a direct or indirect ownership interest in the source, or,</li> <li>• who sold or installed the equipment used by the source.</li> </ul>	
2505.09(h)	The fact that a provider of electricity installed the customer-sited source or source producing useful thermal energy shall not be a disqualifying relationship.	
2505.09(i)	<i>The duties of the independent monitor shall be:</i>	Initials
2505.09(i)(1)	To perform an initial inspection of source's meter for accuracy and capability to measure the electricity or useful thermal energy produced, unless the meter is owned by a distribution utility that has already inspected it pursuant to <a href="#">Puc 305</a> .	
2505.09(i)(2)	To measure quarterly the source's electricity or useful thermal energy production or displacement used to qualify for certificates pursuant to the GIS operating rules.	
2505.09(i)(3)	To report the production of electricity or useful thermal energy from the source and the REC calculation to the customer and the GIS quarterly in accordance with the GIS operating rules.	
2505.09(j)	An independent monitor shall not receive compensation for monitoring services that is a function of the number of certificates issued to any source using the independent monitor.	
2505.09(k)	An independent monitor shall provide the commission with the notice prior to discontinuing services as a monitor.	



Describe your rates for Renewable Energy Source Eligibility for Independent Monitoring (add lines as needed).

Description:	Unit	Rate
Independent Monitor Services	Per hour	\$175
Travel time	Per hour	\$100
Expenses, including vehicle mileage	NA	Cost+15%
	Flat fee	\$
	Annual	\$

#### AFFIDAVIT

The undersigned applicant declares under penalty of perjury that contents of this application are accurate.

Applicant's Signature

Gary Phetteplace

Date 11 February 2015

Applicant's Typed Name Gary Phetteplace

Subscribed and sworn before me this

11<sup>th</sup>

Day of

Feb

(month) in the year

2015

County of

Grafton

State of

NH / New Hampshire

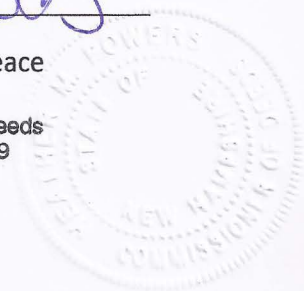
Heather M Powers

Notary Public/Justice of the Peace

My Commission Expires

HEATHER M. POWERS, Commissioner of Deeds

My Commission Expires January 29, 2019





# State of New Hampshire

## Board of Registration for Professional Engineers

105 Loudon Road, Room 318  
Concord, NH 03301

JOHN E. LYONS, P.E., Chairman  
WILLIAM L. FLETCHER, P.E.,  
Vice-Chairman  
MALCOLM J. CHASE, P.E.  
S. RUSSELL STEARNS, P.E.  
STANLEY P. SAWYER, P.E.,  
Secretary

March 18, 1980

Effected date: 3/18/80

Gary Edwin Phetteplace  
PO Box 37  
Graham, NH 03753

Dear Mr. Phetteplace:

Your application for registration has been approved by the New Hampshire State Board of Registration for Professional Engineers, and you will be registered under Chapter 319 which authorizes you to use the title of Registered Professional Engineer upon acceptance of the impression of your seal by the Board. Your Certificate number is 4644.

Section 21 of Chapter 319 provides that - "Each registrant hereunder shall upon registration obtain a seal of the design authorized by the Board, bearing the registrant's name and the legend 'Registered Professional Engineer.'" An impression of the authorized seal is shown hereon. Your name and Certificate number are to replace those shown by the impression. Either the impression type of seal or the rubber stamp type is acceptable. You are advised that it is mandatory to have an approved type seal or stamp. This is a matter of law - not of choice.

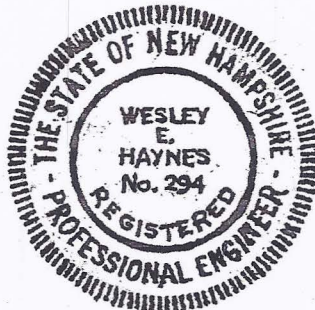
Enclosed herewith is a form to which you shall affix your signature and the impression of your seal as indicated and return to the Board for approval. After the Board has approved the impression of your seal and received your check for \$25.00 registration fee, your certificate of registration will be engrossed and mailed to you. You will receive the engrossed certificate approximately three months after submission of the impression of your seal and fee. Qualifying Branch for Roster: MECH.

Very truly yours,

Stanley P. Sawyer, PE  
Secretary

lja

enc.



THIS IS TO



CERTIFY

**GARY E PHETTEPLACE**  
IS A  
**LICENSED PROFESSIONAL ENGINEER**  
IN THE STATE OF NEW HAMPSHIRE  
LICENSE NO. EXPIRES

**04644**

**6/30/16**



Resume  
**Gary E. Phetteplace**  
(updated November 2013)

**Education:**

BS in Mechanical Engineering, Northeastern University, 1975.

MS in Engineering, Thayer School of Engineering, Dartmouth College, 1981.

Ph.D. in Mechanical Engineering, Stanford University, 1994. Dissertation Title: "Optimal Design of Piping Systems for District Heating".

My major areas of study, both undergraduate and graduate, were: thermodynamics, fluid systems, energy conversion, heat transfer, numerical methods, optimization, and applied mathematics.

**Experience:**

Much of my experience was obtained as a Research Mechanical Engineer in the employ of the US Army Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH, from 1975 until my retirement in July 2007. My research at CRREL was concentrated in the areas of: theory and practice of district heating and cooling (DHC), heat pump systems, numerical and analytical methods for approximating heat transfer in soil systems including freezing and thawing, and energy conversion.

Since 2007 as President of GWA Research LLC I have acted as a private consultant/expert for various interests in the fields of DHC, Ground-Source Heat Pumps (GSHP), heat transfer, and other areas. I have extensive experience both analytical and experimental in heat transfer from buried piping system and the calculation and impacts of soil temperatures .

I recently led an international team of experts in authoring the ASHRAE District Cooling Guide (published in June 2013) and a ASHRAE District Heating Guide (published in September 2013). This was a five year effort for the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE).

I have served on, or chaired, a number of panels and committees on both the national and international level. I am a frequent reviewer of papers, reports, and journal articles for various national and international organizations. I am a frequent and major contributor to guidance documents for the engineering community, such as the ASHRAE Handbooks. Until recently I was the long-standing editor and Handbook Committee Chairman for ASHRAE TC6.2, District Heating and Cooling. In that capacity I contributed all the thermal and hydraulic analysis sections as well as other portions for many past editions and the current 2012 edition of the ASHRAE Handbook, HVAC Systems and Equipment Volume, Chapter 12. Until the present, this has been the most authoritative design guidance for district heating and cooling systems in the US; it has now been eclipsed by the ASHRAE guides my team prepared as discussed above.

My field experience is extensive and includes projects in all regions of the continental United States as well as Alaska, Greenland, and Antarctica. I have participated in approximately 200 exploratory excavations of steam, hot water, and chilled water distribution systems and many more inspections of adjacent manholes for such systems.



**Major Awards**

November 1987 - October 1988, Department of Defense Research and Engineering Fellowship, two months spent at Technical University of Denmark and ten months spent at Stanford University.

1997, Vice Presidential "Hammer" Award, for role in Ground-Coupled Heat Pump Project at Ft. Polk.

1998, Guest Professorship (two months) at Technical University of Denmark, Lyngby, Denmark to work on heat transfer from buried piping systems.

2005, Army R&D Achievement Award and ERDC R&D Achievement Award for role in Microencapsulated Phase Change Material project.

2011, Antarctic Service Medal, National Science Foundation, for contributions to the U. S. Antarctic Program.

2011, George B. Hightower Technical Achievement Award, American Society of Heating, Refrigerating, and Air Conditioning Engineers, (ASHRAE) in recognition of excellence in volunteer service in the area technical leadership and contributions.

**Professional:**

Registered Professional Engineer: Alaska, California, Massachusetts, Maryland, New Hampshire, and Vermont.

Member, American Society of Mechanical Engineers (ASME).

Member, American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), Member and Past Chairman (two non-concurrent terms) of Technical Committee (TC) 6.8 - Geothermal Energy Utilization, Member and Past Chairman of TC 6.2 - District Heating and Cooling. Past Chairman of Research Subcommittee of TC6.2. Past Chairman of Handbook Subcommittee TC6.2.

Member, ASTM International, member of Task Group developing standard for low temperature district heating piping.

**Publications:**

Over 140 publications. A list is available upon request.

**Contact Information:**

Gary Phetteplace, PhD, PE  
GWA Research, LLC  
7 Masa Morey Lane  
Lyme, NH 03768  
603-795-4920  
garyp@gwaresearch.com