



To: United States Environmental Protection Agency

From: Shawn Genung, Managing Partner, Project Development Strategy & Validation

Date: Friday, October 9, 2009

Re: Draft 1 ENERGY STAR Version 3.0 Geothermal Heat Pump comments

To whom it may concern,

Project Development Strategy & Validation (PDSV) is currently providing research and development consulting services to a geothermal heat pump manufacturer of a novel and patented ground source heat pump which we would contend meets the AHRI Standard 870-2005 definitions for a direct exchange heat pump. However, as a result of the verbiage selected for the proposed Energy Star revisions, the system would not be accounted for as a Direct GeoExchange (DGX) system in the proposed revision.

The system embodiment in question is a DX (or DGX) heat pump consisting of traditional DX indoor components and the defining outdoor heat exchange loop containing a refrigerant gas. However rather than exchanging heat directly with the ground, the refrigerant loop exchanges with buried water baths which in turn exchange with the ground. The water baths are integral to the design of the system, housing the heat exchangers and being provided as fully enclosed components of the system which are linked in parallel to a distribution nozzle and collector manifold, not unlike the multiple circuits of a traditional outdoor air source unit. In effect, the system operates no differently than a DX “pond loop” rather than a DX “ground loop” – both of which are covered under Standard 870. Unfortunately, while Energy Star does consider a “Ground Heat Exchanger” (Line 202) to be a method by which heat is exchanged with the ground, *groundwater* or *surface water*, it appears that the definitions provided in the proposed Energy Star revision exclude a DX pond loop and likewise the system proposed by our client.

PDSV would propose the following modifications to the proposed revision as well as any which we may have overlooked which support the incorporation of “water source DX” into ground source geothermal in the same way that “water source (open or closed loop) heat pumps” are incorporated into ground source geothermal:

- Line 205: ... or direct refrigerant-to-ground *or refrigerant-to-water* heat exchange.
- Line 228: ... in pipes buried in the ground *or submerged in water which exchanges heat with the ground*, rather than using a secondary heat transfer fluid...
- Line 251: ... for DGX systems...

Thank you for your consideration,

Shawn Genung

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