BEFORE THE GOVERNOR'S ENERGY DIRECTOR

COMMENT/REPLY COMMENT INFORMATION FORM

Rulemaking to adopt, amend, or repeal)
regulations pertaining to Chapter 701)
of the Nevada Administrative Code related)
to the conservation of energy in buildings,)
including manufactured homes, adoption)
of 2012 IECC pursuant to Nevada Revised)
Statutes 701.220.)
_____)

Please complete and submit this form with your written comments:

Date of Filing: January 23, 2014

Method of Filing: [X] via E-mail [ ] U.S. Postal Mail [ ] Fax

Name of Person Commenting: Mike Moore, P.E.

Name of Organization *(if applicable)*: Newport Ventures

Address: 22 Jay Street, Schenectady, New York, 12305

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Would you like to receive future notices? [X] Yes [ ] No

Note: Submitted comments are part of the public record for the rulemaking and may be posted on the Office of Energy website at energy.nv.gov.

Please send to:
Governor's Office of Energy
Attn: Emily H. Nunez
755 North Roop Street, Suite 202
Carson City, NV 89701
Fax: (775) 687-1861
ehnunez@energy.nv.gov

NEWPORT VENTURES

January 23, 2014

Governor's Office of Energy
Attn: Emily Nunez
755 North Roop Street, Suite 202
Carson City, Nevada 89701
Re: Adoption of the 2012 IECC

Dear Ms. Nunez:

We appreciate the opportunity to provide comments for the content of the Nevada Energy Code. This comment addresses the state's adoption of the 2012 IECC and our recommendation to include the ventilation provisions of Section M1507 of the 2012 IRC as part of the adoption of the IECC (proposed change appended at the end of this letter).

As you are aware, the 2012 IECC requires tighter dwellings than were required under the 2009 IECC. According to Section R402.4.1.2, dwellings are required to have an air leakage rate of 3 ACH 50 or less in Nevada's two climate zones. While these improvements to the air tightness of dwellings are considered a cost effective way to save energy, it is important to simultaneously equip dwellings with mechanical ventilation to provide acceptable indoor air quality. Recognizing this, Section R403.5 of the 2012 IECC requires that mechanical ventilation be provided for each dwelling unit. However, the IECC does not clearly specify how this mechanical ventilation is to be provided. For this, it is necessary to reference the 2012 IRC or the 2012 IMC, as appropriate.

Within the 2012 version of the IRC, Section M1507 was re-written to address the latest industry recommendations for sizing and specifying mechanical ventilation systems for indoor air quality, including requirements for local exhaust and whole house mechanical ventilation. These requirements were based on ASHRAE 62.2, the industry consensus standard for "Ventilation and Acceptable Indoor Air Quality for Low-Rise Residential Buildings". For instance, 2012 IRC Table M1507.3.3(1) specifies the whole house mechanical ventilation system air flow rate in cubic feet per minute for a dwelling based on the conditioned floor area and the number of bedrooms the dwelling contains. Similarly, Table M1507.4 specifies the air flow rate for local exhaust systems located in kitchens and bathroom or toilet rooms. When Section M1507 of the 2012 IRC is combined with Table R403.5.1 of the 2012 IECC (which stipulates the energy efficacy level of the whole house mechanical ventilation fan), the architect/builder/contractor has all the information needed to specify an energy efficient ventilation system for dwelling units within the scope of the IRC, including critical information for flow rates, controls, fan type, and fan efficacy.

Adopting Section M1507 of the 2012 IRC alongside the 2012 IECC will set clear, prescriptive requirements for specifications of mechanical ventilation systems for dwellings that are compliant with the latest industry standards for acceptable indoor air quality, are easily applied by the builder/designer/contractor, and are easily enforced by the code official. For these reasons, it is our recommendation that Office of Energy adopt Section M1507 of the 2012 IRC along with the 2012 IECC. If the 2012 IECC is adopted without Section M1507 of the 2012 IECC, there's concern that indoor air quality in dwellings could be compromised, architects/builders/contractors

would not be equipped to properly specify and install ventilation systems, and building officials would have difficulty in enforcing the mechanical ventilation requirements in Section R403.5 of the IECC.

Finally, when the State of Illinois recently adopted the 2012 IECC without the 2012 IRC, they elected to incorporate the ventilation provisions of the 2012 IRC within Section R403.5, for many of the same reasons listed above. We believe this serves as an important precedent for our recommendation to include Section M1507 of the IRC as part of Nevada's adoption of the 2012 IECC.

If you have any questions about this recommendation, please feel free to contact me. Thank you for your thoughtful consideration.

Sincerely,

Mike Moore, P.E.
mmoore@newportventures.net

Proposed Change to the 2012 IECC
Note: all proposed language is copied directly from the 2012 IRC (Chapter 2 and Section M1507) with the exception of double-underlined text, which has been modified slightly from the original for clarification:

Insert new definitions as follows:
LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a dwelling.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation rate.

Replace Section R403.5 as follows:

R403.5 Mechanical ventilation (Mandatory). The building shall be provided with mechanical ventilation that meets the requirements of this section or the International Mechanical Code, as applicable. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

R403.5.1 Whole-house mechanical ventilation system fan efficacy. Mechanical ventilation system fans shall meet the efficacy requirements of Table R403.5.1.
Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

R403.5.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be recirculated within a residence or to another *dwelling unit* and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an *attic*, crawl space or other areas inside the building.

R403.5.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections R403.5.4 through R403.5.6.

R403.5.4 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

R403.5.5 System controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

R403.5.6 Mechanical ventilation rate. The whole house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table R403.5.6(1).
Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25- percent of each 4-hour segment and the ventilation rate prescribed in Table

R403.5.6(1) is multiplied by the factor determined in accordance with Table R403.5.6(2).

R403.5.7 Local exhaust rates. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table R403.5.7.

TABLE R403.5.1
MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

For SI: 1 cfm = 28.3 L/min.

TABLE R403.5.6(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m2, 1 cubic foot per minute = 0.0004719 m3/s.

TABLE R403.5.6(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor [a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table is prohibited.

TABLE R403.5.7
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous