

ASHRAE 62.2 2013 Exceptions for DOE Weatherization Grants

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On the next few pages I have run some examples of houses we have done through the ASHRAE 62.2 2013 calculator on the RED website. I then ran the same houses through the Advanced Infiltration calculator on the same website.

A one story house in Devils Lake, ND.
 1700 sq ft
 Blower door test at 50Pa - 1300

RED ASHRAE 62.2-2013 Ventilation Reset Print i

New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [ft²] 1700

Number of occupants 2

Building height [ft] 11

Measured leakage @ 50Pa [CFM] 1300

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [°F] 70

Outdoor temperature [°F] 70

Altitude [ft] 1600

Pressure exponent 0.65

Adjusted leakage @ 50Pa [CFM] = 1313

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	125	<input checked="" type="checkbox"/>	0
Bath #1	0	<input checked="" type="checkbox"/>	30
Bath #2	0	<input type="checkbox"/>	50

Total deficit [CFM] = 80

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 24.6

Effective annual avg infiltration rate [CFM] = 53

Total required ventilation rate [CFM] = 66

Alternative compliance supplement [CFM] = 20

Infiltration credit [CFM] = 53

Required mechanical ventilation rate [CFM] = 33

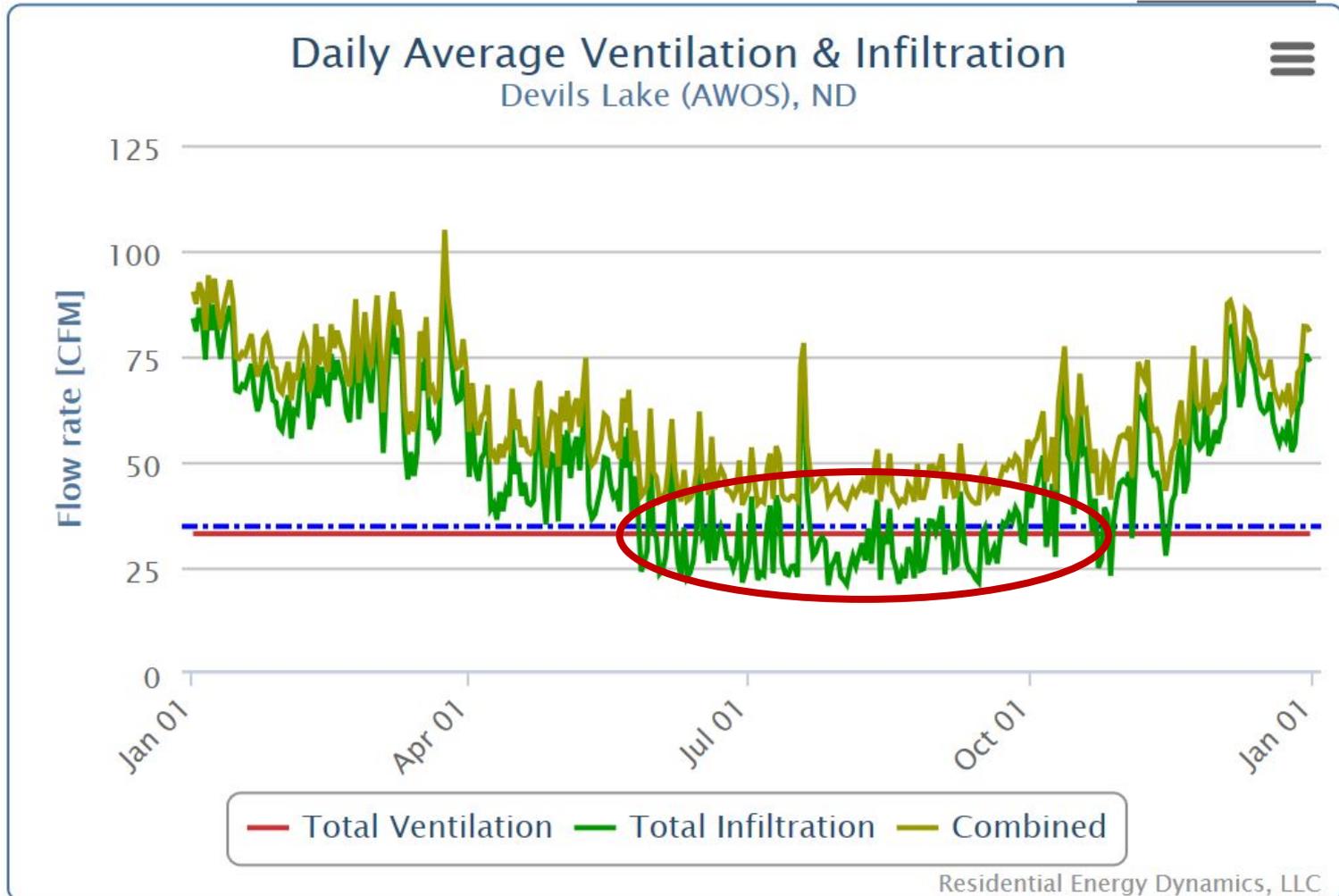
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [CFM] 100

Fan run-time per hour [min] = 19.6

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Infiltration rate only goes below required mechanical ventilation rate for a few months – in North Dakota this is “open window season”



Same house but a little leakier and one of the bathrooms now has a fan.

ASHRAE 62.2-2013 Ventilation Reset Print i

New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [] 1700

Number of occupants

Building height [] 11

Measured leakage @ 50Pa [] 1500

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [] 70

Outdoor temperature [] 70

Altitude [] 1600

Pressure exponent

Adjusted leakage @ 50Pa [] = 1515

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [<input type="text" value="CFM"/>]	Openable Window	Deficit [<input type="text" value="CFM"/>]
Kitchen	<input type="text" value="125"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
Bath #1	<input type="text" value="30"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
Bath #2	<input type="text" value="0"/>	<input type="checkbox"/>	<input type="text" value="50"/>

Total deficit [] = 50

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 24.6

Effective annual avg infiltration rate [] = 61

Total required ventilation rate [] = 66

Alternative compliance supplement [] = 12.5

Infiltration credit [] = 61

Required mechanical ventilation rate [] = 17

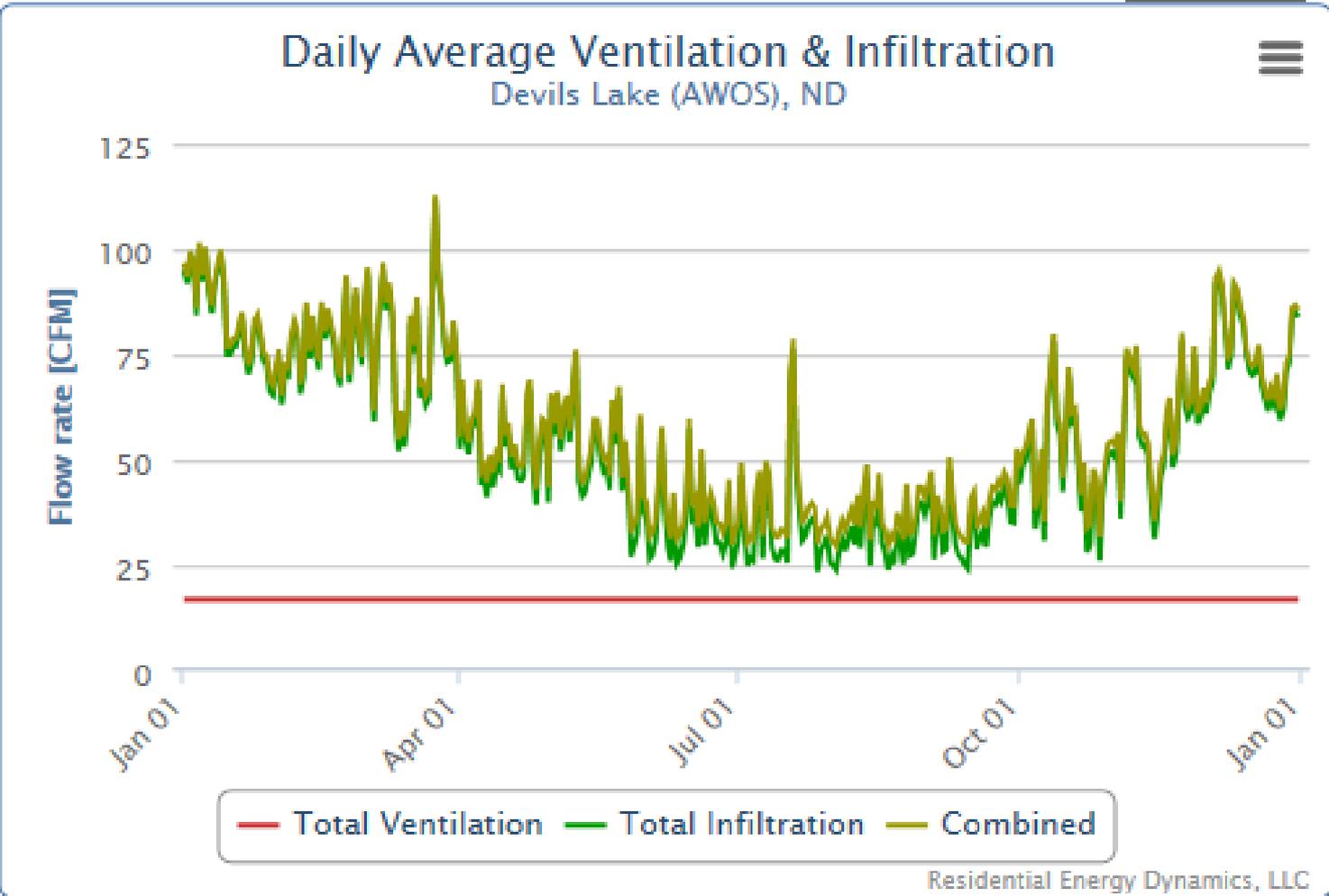
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [] 100

Fan run-time per hour [] = 10

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The infiltration rate never goes below the required mechanical ventilation rate.



Same house – leakage is at the level the building code uses to determine whether to use ASHRAE 62.2 or not – about .67 cfm per sq ft

RED ASHRAE 62.2-2013 Ventilation Reset Print i

New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [ft²]

Number of occupants

Building height [ft]

Measured leakage @ 50Pa

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [°F]

Outdoor temperature [°F]

Altitude [ft]

Pressure exponent

Adjusted leakage @ 50Pa

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	<input type="text" value="75"/>	<input checked="" type="checkbox"/>	5
Bath #1	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	30
Bath #2	<input type="text" value="0"/>	<input type="checkbox"/>	50

Total deficit [CFM] = 85

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 24.6

Effective annual avg infiltration rate [CFM] = 47

Total required ventilation rate [CFM] = 66

Alternative compliance supplement [CFM] = 21.25

Infiltration credit [CFM] = 47

Required mechanical ventilation rate [CFM] = 41

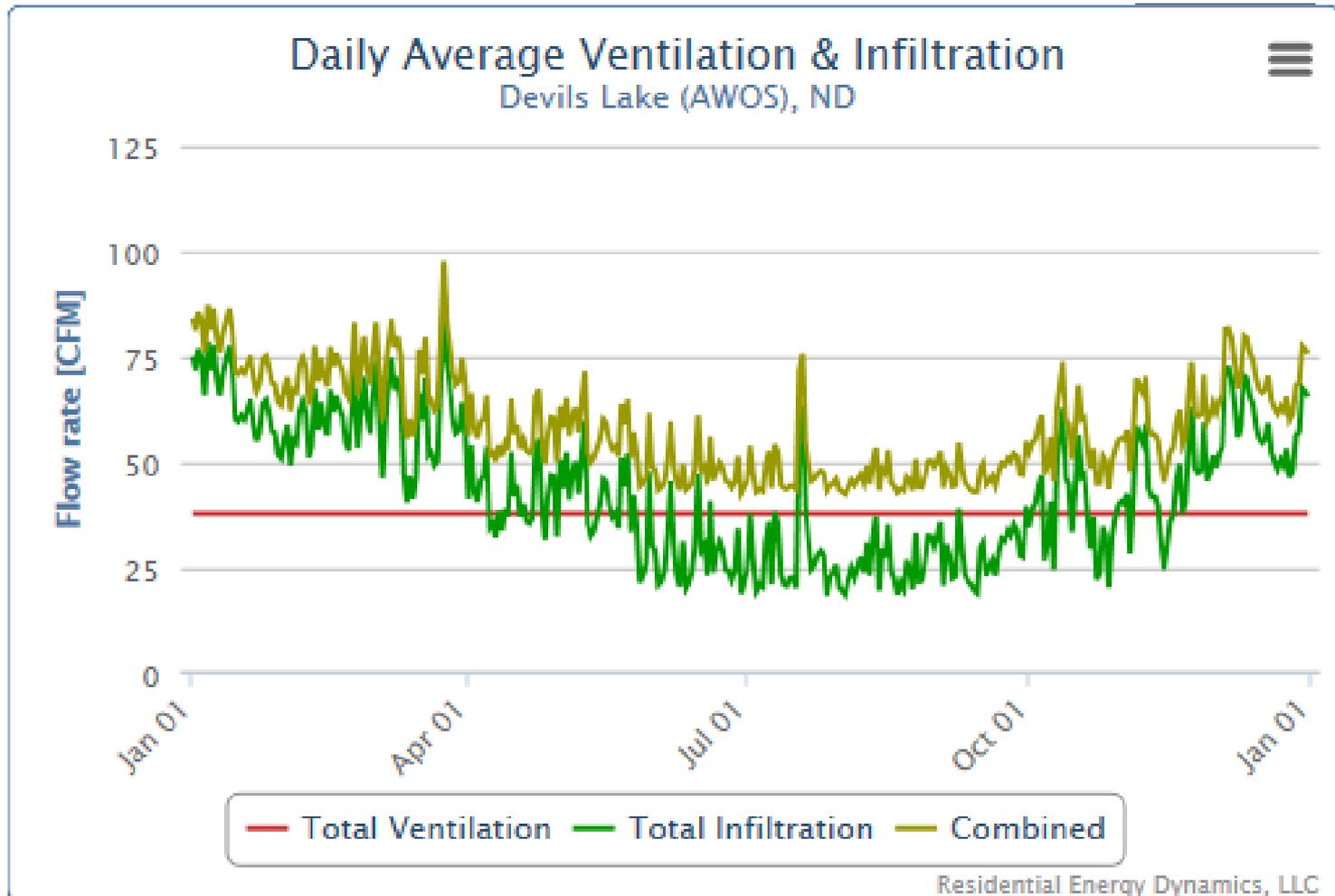
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [CFM]

Fan run-time per hour [min] = 24.3

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Again, infiltration rate only goes below required mechanical ventilation rate for a few months.



A larger house – 2 story with 2400 sq ft
Blower door test at 50Pa - 1500

RED ASHRAE 62.2-2013 Ventilation Reset Print i

New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [ft²] 2400

Number of occupants 5

Building height [ft] 18

Measured leakage @ 50Pa [CFM] 1500

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [°F] 70

Outdoor temperature [°F] 70

Altitude [ft] 1600

Pressure exponent 0.65

Adjusted leakage @ 50Pa [CFM] = 1515

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	75	<input checked="" type="checkbox"/>	5
Bath #1	30	<input checked="" type="checkbox"/>	0
Bath #2	20	<input type="checkbox"/>	30

Total deficit [CFM] = 35

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 20.2

Effective annual avg infiltration rate [CFM] = 75

Total required ventilation rate [CFM] = 109.5

Alternative compliance supplement [CFM] = 8.75

Infiltration credit [CFM] = 75

Required mechanical ventilation rate [CFM] = 43

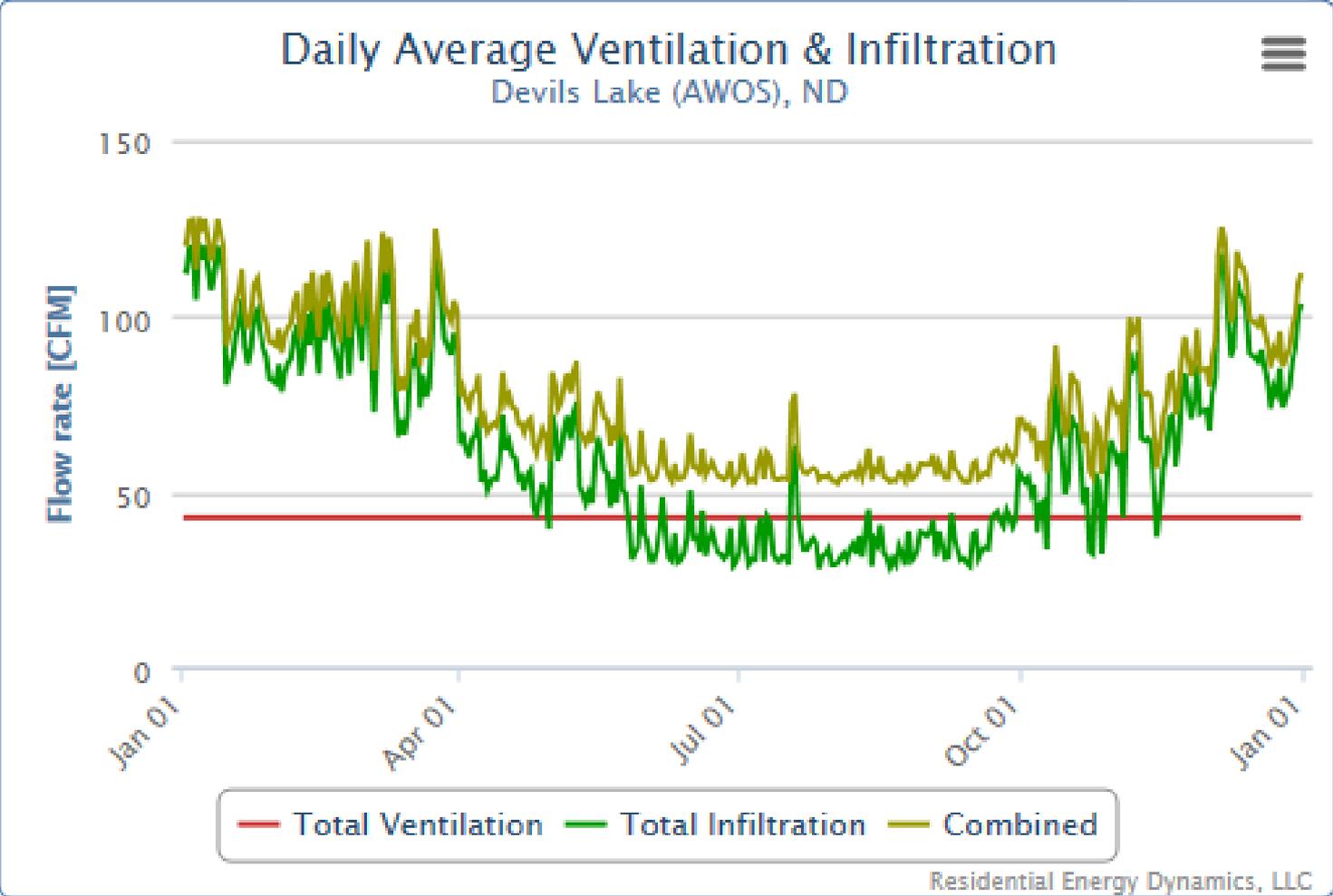
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [CFM] 100

Fan run-time per hour [min] = 26

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Infiltration only slightly under the required mechanical ventilation rate and only for the same few months.



Same house but a little more air leakage. A realistic level of air leakage for a house this size.



ASHRAE 62.2-2013 Ventilation



New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [ft²]

Number of occupants

Building height [ft]

Measured leakage @ 50Pa

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [°F]

Outdoor temperature [°F]

Altitude [ft]

Pressure exponent

Adjusted leakage @ 50Pa

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	<input type="text" value="75"/>	<input checked="" type="checkbox"/>	5
Bath #1	<input type="text" value="30"/>	<input checked="" type="checkbox"/>	0
Bath #2	<input type="text" value="20"/>	<input type="checkbox"/>	30

Total deficit [CFM] = 35

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 20.2

Effective annual avg infiltration rate [CFM] = 110

Total required ventilation rate [CFM] = 109.5

Alternative compliance supplement [CFM] = 8.75

Infiltration credit [CFM] = 110

Required mechanical ventilation rate:

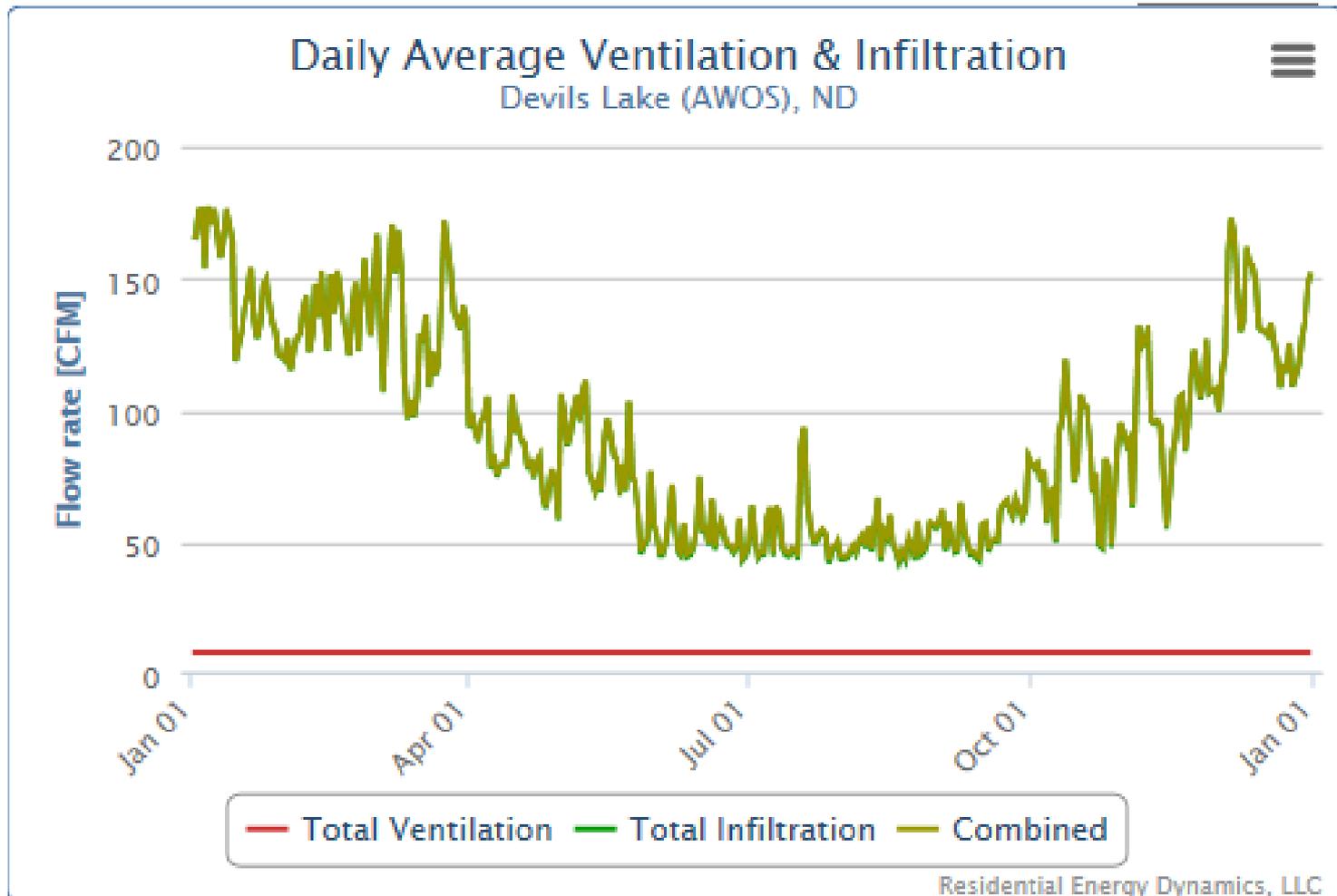
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [CFM]

Fan run-time per hour [min] = 5.1

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Not even close to going below the mechanical ventilation rate.



Same house – leakage is at the level the building code uses to determine whether to use ASHRAE 62.2 or not – about .67 cfm per sq ft

RED ASHRAE 62.2-2013 Ventilation Reset Print i

New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area [ft²] 2400

Number of occupants 5

Building height [ft] 18

Measured leakage @ 50Pa [CFM] 1608

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature [°F] 70

Outdoor temperature [°F] 70

Altitude [ft] 1600

Pressure exponent 0.65

Adjusted leakage @ 50Pa [CFM] = 1624

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [CFM]	Openable Window	Deficit [CFM]
Kitchen	75	<input checked="" type="checkbox"/>	5
Bath #1	30	<input checked="" type="checkbox"/>	0
Bath #2	20	<input type="checkbox"/>	30

Total deficit [CFM] = 35

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 20.2

Effective annual avg infiltration rate [CFM] = 80

Total required ventilation rate [CFM] = 109.5

Alternative compliance supplement [CFM] = 8.75

Infiltration credit [CFM] = 80

Required mechanical ventilation rate [CFM] = 38

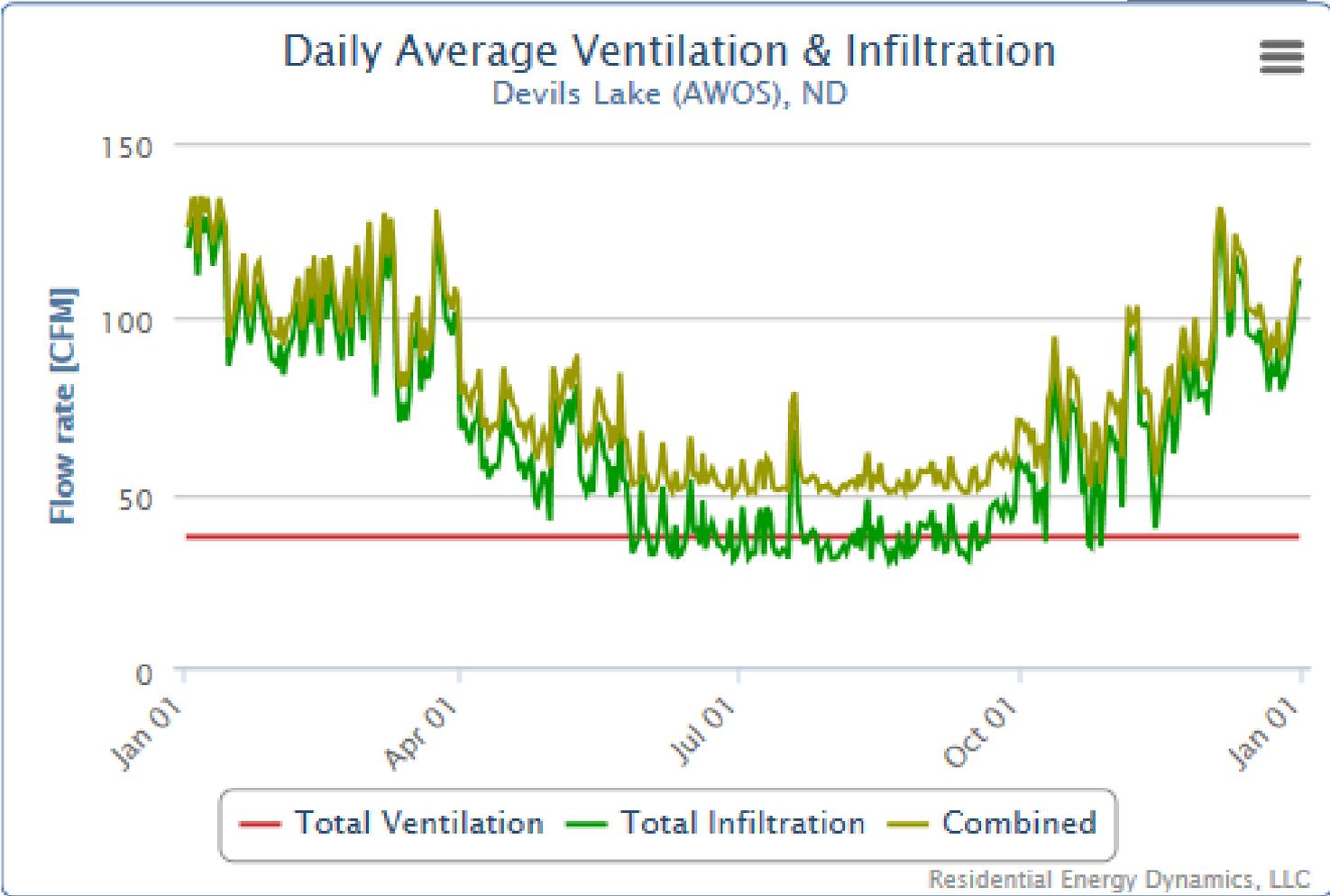
Whole-Bldg Ventilation Run-Time Tool

Fan capacity [CFM] 100

Fan run-time per hour [min] = 23

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Infiltration only slightly below the mechanical ventilation rate for those same few months.



A mobile home with a pretty average amount of air leakage – 1200 cfm50.



ASHRAE 62.2-2013 Ventilation



New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area []

Number of occupants

Building height []

Measured leakage @ 50Pa []

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature []

Outdoor temperature []

Altitude []

Pressure exponent

Adjusted leakage @ 50Pa [] = 1212

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [<input type="text" value="CFM"/>]	Openable Window	Deficit [<input type="text" value="CFM"/>]
Kitchen	<input type="text" value="75"/>	<input checked="" type="checkbox"/>	<input type="text" value="5"/>
Bath #1	<input type="text" value="25"/>	<input checked="" type="checkbox"/>	<input type="text" value="5"/>
Bath #2	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="30"/>

Total deficit [] = 40

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 24.6

Effective annual avg infiltration rate [] = 49

Total required ventilation rate [] = 57.72

Alternative compliance supplement [] = 10

Infiltration credit [] = 49

Required mechanical ventilation rate: [] = 19

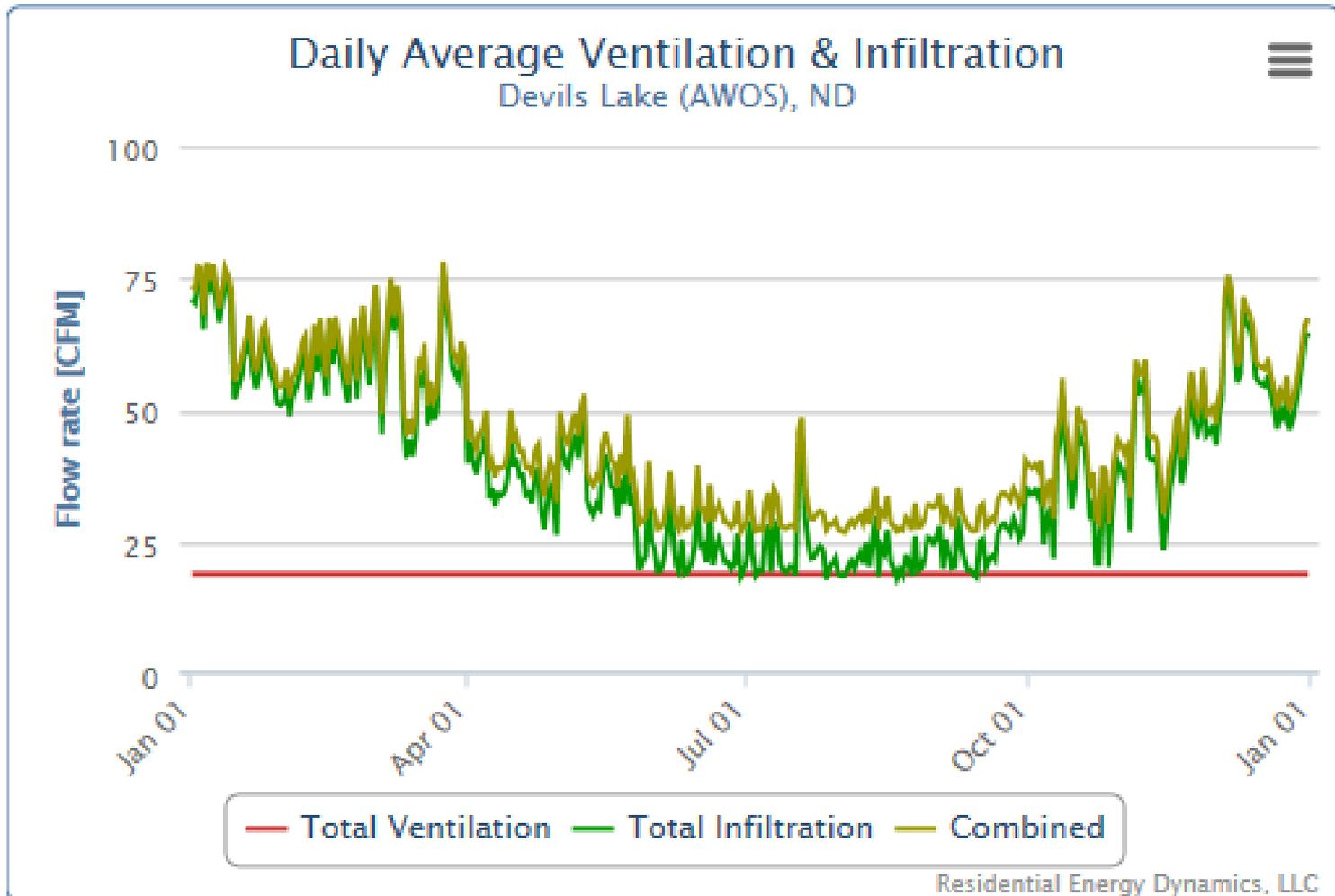
Whole-Bldg Ventilation Run-Time Tool

Fan capacity []

Fan run-time per hour [] = 11.1

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Infiltration stays at or above required mechanical ventilation rate.



Same mobile home – leakage is at 1 cfm50 per sq ft.


ASHRAE 62.2-2013 Ventilation



New or existing construction

Use infiltration credit

Closest weather station

Weather and shielding factor [1/hr] = 0.69

Living area []

Number of occupants

Building height []

Measured leakage @ 50Pa []

Use Advanced Blower Door Inputs

Blower door test type

Indoor temperature []

Outdoor temperature []

Altitude []

Pressure exponent

Adjusted leakage @ 50Pa [] = 933.3

Use Local Ventilation Alternative Compliance

Kitchen included # Baths included

	Existing Flow [<input type="text" value="CFM"/>]	Openable Window	Deficit [<input type="text" value="CFM"/>]
Kitchen	<input type="text" value="75"/>	<input checked="" type="checkbox"/>	5
Bath #1	<input type="text" value="25"/>	<input checked="" type="checkbox"/>	5
Bath #2	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	30

Total deficit [] = 40

Whole-Bldg Ventilation Results

N-factor₂₀₁₃ = 24.6

Effective annual avg infiltration rate [] = 38

Total required ventilation rate [] = 57.72

Alternative compliance supplement [] = 10

Infiltration credit [] = 38

Required mechanical ventilation rate [] = 30

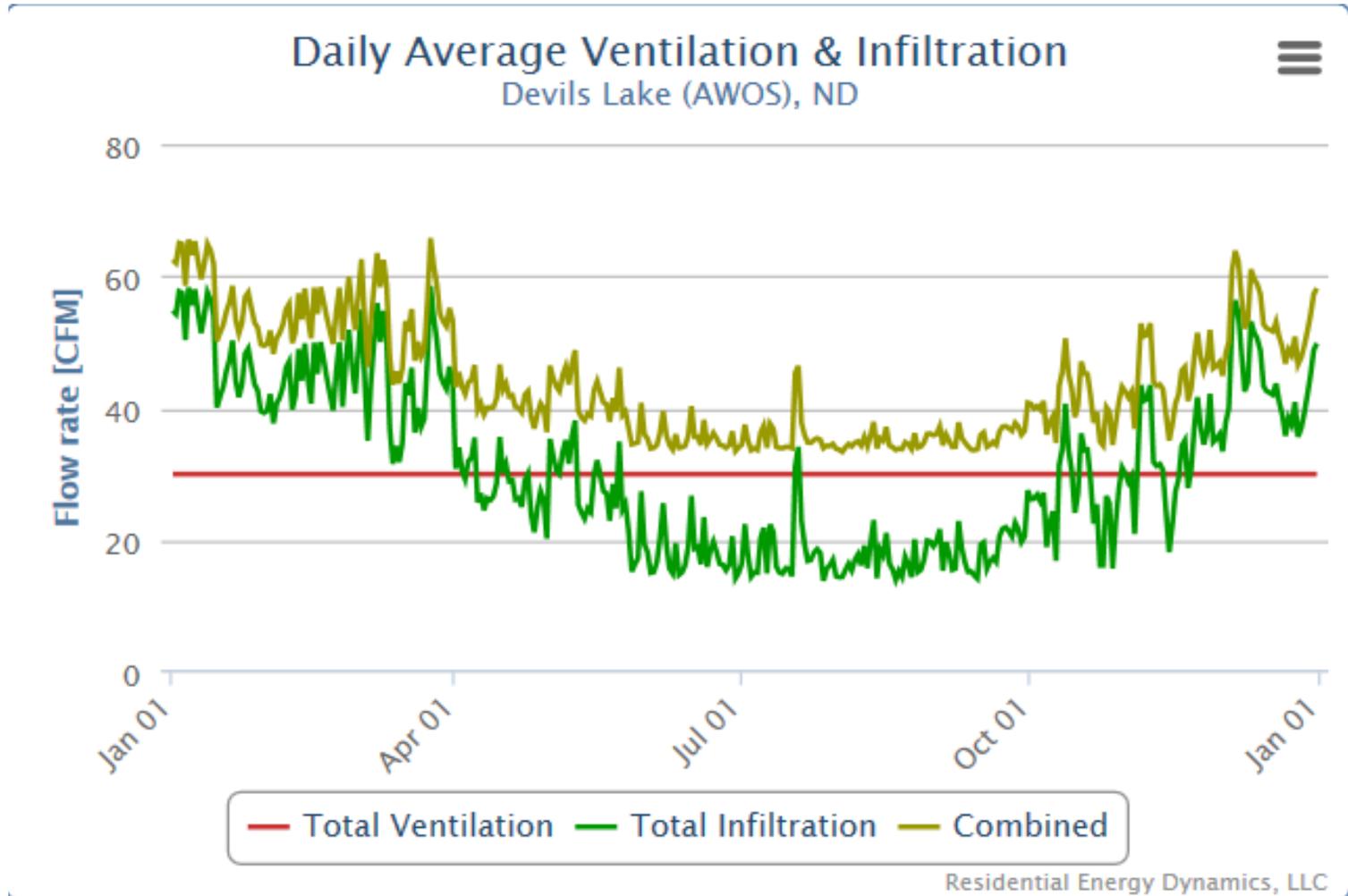
Whole-Bldg Ventilation Run-Time Tool

Fan capacity []

Fan run-time per hour [] = 22.4

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Infiltration goes below required mechanical ventilation rate but during the same months.



ASHRAE 62.2 2013 Exceptions for DOE Weatherization Grants

Based on information on these slides and other homes I have run through the calculations, I would like to ask for the following exceptions to ASHRAE 62.2 2013:

1. For site built homes we would only use ASHRAE 62.2 2013 on dwellings tighter than the level (.67 cfm50 per sq ft) the 2012 International Residential Code code sets for using the standard.
2. For manufactured homes we would only use ASHRAE 62.2 2013 on dwellings tighter than 1 cfm50 per sq ft.
3. If after running the ASHRAE 62.2 2013 calculation on a dwelling it needs 20 cfm or less of added continuous mechanical ventilation we would not be required to add ventilation.

Atmospherically Vented Appliances

6.4 Combustion and Solid-Fuel Burning Appliances.

Where atmospherically vented combustion appliances or solid-fuel burning appliances are located inside the pressure boundary, **the total net exhaust flow of the two largest exhaust fans** (not including a summer cooling fan intended to be operated only when windows or other air inlets are open) shall not exceed **15 cfm per 100 ft²** of occupiable space when in operation at full capacity. If the designed total net flow exceeds this limit, **the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor airflow.** Atmospherically vented combustion appliances do not include direct-vent appliances.

ASHRAE 62.2 2013 Exceptions for DOE Weatherization Grants

4. We would like to ask for an exception to section 6.4 of ASHRAE 62.2 2013. Since our worst case draft test covers these problems, we should not have to do extra work on existing ventilation or add more air if there is no problem existing.
5. If following the requirements of ASHRAE 62.2 2013 cause negative pressures in the dwelling that would interfere in appliances not meeting draft requirements resulting in having to replace water heaters or furnaces, we would not be required to follow ASHRAE 62.2 2013. We would only use this exception after all possible methods were considered (supply air, balanced ventilation, etc.) If we do not get this exception we will have to defer these homes because of the amount of Health and Safety money we were allowed to budget.