

LEGAL ISSUES FOR AFFORDABLE RENTAL CABINS FOR THE EHS/MCS

by Dr. Gary L. Johnson

As is detailed on my website emsri.org, I own a gulch in Rockvale, Colorado, with rather low electromagnetic field pollution. Soon after I bought it in 2012, I started thinking about building perhaps 20-25 cabins in the gulch and renting them to those with EHS/MCS. I mentioned this on my website and in private communications. I have been plotting strategy for doing this since then. Unfortunately, I have come to the realization that it is illegal to build affordable housing in Colorado, so my dream of building multiple cabins in my gulch just cannot happen without a number of legal barriers being removed. This document is a first attempt to discuss some of the more important issues.

The vast majority of medical people and politicians view EHS as a psychological problem, so the chances of getting government subsidies or assistance is somewhere between slim and none. Cabins will need to be built with a hope of adequate rent to repay the cost of construction and give the builder at least a small profit. Some EHS/MCS are on disability, receiving perhaps \$750 per month to live on. They can afford perhaps \$300 per month for rent and utilities. I then ask: Is it possible to build a cabin and rent it for that amount (without subsidy)? I think that it might be possible, but it will require some lowering of expectations. Let me randomly comment on these.

HOUSING FOR THE HOMELESS The USA has an affordable housing crisis, with ever increasing numbers of the homeless. I am on a steering committee for a local church that wants to build 20 tiny houses for the homeless, on a five acre plot they own, about a mile outside of Florence, Colorado. The town's population is about 4000. One of the pastors on the committee was involved in the yearly homeless count, and found 75 homeless in the town or within a mile or so of the town limits. Colorado Springs has homeless camps, tent cities, where two or three hundred homeless will live on a vacant piece of land. The homeless situation in California is a regular news topic. Some with EHS/MCS are homeless also, living in their car in a National Forest in an effort to get away from the electromagnetic soup we now find ourselves immersed in.

One would think that an offer to build 20 tiny houses for the homeless would be immediately accepted by the Florence town board, but such is not the case. Nor does it seem to be across the country. A common 'solution' is for the government to build apartment buildings with the same amenities as a for-profit apartment building, and then rent the apartments at a subsidized rate. There is never enough money to build enough buildings, so the apartments fill up immediately and the tent cities continue to

grow. What are the attitudes that are contributing to this homeless growth?

LET THEM BE HOMELESS SOMEWHERE ELSE! My wife grew up in a small farm town in eastern Kansas with a town ordinance that no black person could stay overnight in the town. This ordinance would have been put in place by honest, hard working, Christian people. Justifications at town meetings would have included arguments about personal safety, and about property values. I suspect a vast majority would agree with the statement: “We love black people. Just let them be black somewhere else.” If some agitator asked: “But what if *every* jurisdiction in the country passed the same ordinance? What would the blacks do then?”, the response would probably be a blank stare. Fortunately we finally decided as a nation that discriminating against a person just because of the color of his skin was wrong.

We are at a similar point with regard to the homeless. We give them money at Walmart and on street corners. We help out at food pantries and soup kitchens. But we want them to be homeless somewhere else! I once attended a small Methodist church in Florence, located on the main street next to a grocery store with public restrooms. A homeless man asked the pastor if he could sit on the church steps during the day. The pastor assured him that that would be fine, but then caught some flack from members of the congregation! The police regularly harass the homeless. The hope seems to be that if the harassment is severe enough the homeless person will move to some other jurisdiction. Harassment perhaps worked in the past, but the homeless numbers are now reaching the point where many of us realize that we should try something else.

GOVERNMENT MANDATED HOMELESSNESS One issue that we should be talking about is the fact that our government is actually mandating homelessness by city ordinances. Rockvale says that the minimum floor area of a house must be at least 1400 square feet. That translates to a house value of perhaps \$150,000 with a monthly mortgage payment of perhaps \$900. What about the family who can only afford \$500 per month? The town is saying that if you are poor, you can be poor somewhere else. As a nation, we decided that discriminating against skin color, religion, etc. is wrong, but we still allow discriminating against the poor. There is a nationwide excitement about tiny houses for affordable housing, but getting minimum square footage changed is a monumental task. There is always a very vocal local group that waves the flag of property values and insists that the poor be poor somewhere else. I really do not see this barrier changing unless there is national legislation to level the playing field. If no local jurisdiction could stop tiny houses because it is wrong to discriminate against the poor, then we might see some reduction in homeless numbers. I think I could put 20 or more 1400 ft² cabins in my gulch, but I certainly could not rent them for \$300 per month. It would nice if I had a real option of cabin size. I would be inclined to build different sizes, starting at about 300 ft² and going up to 1400 ft² or so.

WATER Water is a precious commodity in the western United States. We get only about 12 inches of moisture per year here. The state has taken the attitude that all the water in the state belongs to the state, which then has the task of allocating water to potential users. One must have a permit to drill a well. Permits are relatively easy to get if the lot size is 35 acres or more, so the state is basically a patchwork of 35-40 acre lots with one house. The permit for my well on the 40 acre plot allows the water to be used for up to three houses (and a one acre garden). One acre is a *big* garden. There might be room for a 1/3 acre garden in the gulch. My perception is that there would be absolutely no tolerance for trading 2/3 acre of garden watering for a few houses. So I can only use water from the well for three houses.

I suppose it would be possible to run a water line from the end of the town water line in the cul-de-sac about 1/3 of a mile into the gulch and use town water. Digging a trench for a line would be expensive because of the buried boulders. Rockvale charges several thousand dollars hookup fees and \$50 per month for the meter, then \$3 per 1000 gallons for the water, so if they required each cabin to have a meter, it would really put a strain on the allowable budget.

Another possibility would be to harvest rainwater from the roof of each cabin and store it in a cistern. If the cistern ran low, a water truck could buy water in Cañon City and haul it to the cistern. As near as I can tell from the Internet, one cannot legally put rainwater into a cistern and use as potable water inside a cabin in Colorado. I cannot legally put chlorinated town water in the cistern either, unless there is a well permit (and the well production is inadequate).

In fact, until recently, one could not store rainwater coming off the roof at all. That was changed to allow rainwater storage in two barrels, a total up to 110 gallons, for use in watering outdoor plants.

COMPOSTING TOILETS I think the Colorado Plumbing Code requires every dwelling unit to have at least one flush toilet connected to a sewer or septic system. There is no sewer line near the gulch, so each cabin would need to be connected to a septic system. These cost several thousand dollars each, hence makes the cabin less affordable. They would also restrict placement of cabins to locations near a (nearly) level area with appropriate soil percolation characteristics. This would probably reduce the number of allowable cabins in the gulch from 20 or more, with composting toilets, to 5 or less with septic systems. I think it is a true statement that following the existing code increases the cost of each 'affordable' dwelling unit, and decreases the number of places a dwelling unit can be built. Just how critical is it that *every* dwelling unit have a flush toilet and sewer or septic system to public health, safety, and welfare? Why not allow composting toilets instead?

These questions are being asked across the country by many groups, including planning, zoning, and public health agencies. One driving force is the water required for toilet flushing. The American Southwest is short on water. A move toward composting toilets would certainly extend the available supply. I found the book *The Humanure Handbook – a guide to composting human manure* by Joseph Jenkins to be a good source of information. His website is www.josephjenkins.com. Jenkins makes a powerful case for composting rather than flush toilets.

Any move toward allowing composting is resisted by those with fecophobia, the belief that humanure is unsafe for agricultural use, that it is somehow toxic and must be disposed of at great expense. Certainly humanure needs to be dealt with appropriately, but the use of an inexpensive back yard compost bin seems to be quite adequate. On a related topic, I live in a house in the old orchard district of Canon City. Back in 1903, the owners of about 1500 acres of orchards banded together and built a dam across a creek about 30 miles uphill. Water from snowmelt is stored in the reservoir and released into the creek during the summer growing season. The water is then diverted into several ditches flowing through the 1500 acres. If the snowmelt is adequate, the ditch behind my house has water flowing in it from 8 AM to 5 PM, Monday and Thursday. I pump it onto my lawn and garden with a sprinkler system. As surface water, it contains deer poop, bear poop, bird poop, and even some human poop from hunters and hikers. I think I can see a little brown tinge to the water sometimes. The garden, heavily fortified with rabbit poop from a friend's barn, does very well! Tomatoes, lettuce, and cucumbers get a quick rinse at the kitchen sink, hardly qualifying as a disinfecting wash, then in the mouth. I cannot 'prove' it, but I strongly believe that my body craves these vegetables, and feels better after their consumption. I have never been sick after 10 years of eating these vegetables which have been regularly soaked with poop containing water. To my knowledge, no one else has either, after a century of experience. At least no one from the ditch company or the local health department has warned me about bad consequences of eating irrigated vegetables.

I see articles on the Internet about Colorado homes with composting toilets, and know people who live up in the mountains with composting toilets, so there must be a legal path to using them. However, that path was not obvious from a casual inspection of the state of Colorado websites. Since this issue is not of immediate impact to research of the HHRI, and since rules might change before these details are really needed, I let the question of composting toilets drop at this point.

GRAYWATER Blackwater is the output of a flush toilet. Graywater comes from showers, washing dishes and clothes, etc. Just dumping it out back has some real issues (mud, smell, mosquitos, etc.) and is therefore illegal. A rational approach is to build a small wetland, a pit or trench in which the graywater drain ends a few inches

below grade. The trench is filled with gravel to above the drain, then soil to grade level. Done correctly, there will be no mud, no smell, and no mosquitos. I think a graywater system adequate for a small cabin housing one or two people can be built for less than a thousand dollars, if the state is not adamant about inspections and plans from professional engineers. Again, state approval for such a small graywater system is not clearly spelled out by statute.

ELECTRICAL I think all dwelling units in the gulch should be DC only. We charge batteries with photovoltaic panels and then use the battery voltage to power the dwelling units. Inverters would be allowed only for brief periods to drive household appliances that require AC. But what voltage should we use? I have electronic devices that operate on 5 VDC, 9 VDC, and 12 VDC. My old Dell and HP laptops need about 18 VDC. The bulk of LED strips now require 24 VDC. I have a 24 VDC system in my office, two 12 VDC PV panels, and four 6 VDC batteries. I use a 24:12 DC-DC converter to get 12 VDC for a Linux desktop computer and a Lorex security camera system. I think a cabin could be wired for 24 VDC, and even 48 VDC, and meet all National Electrical Code (NEC) requirements. However, there are good reasons to use 120 VDC. This allows the direct use of the new 120 VAC LED bulbs from several different manufacturers. See the file ledcomparison.pdf for more details. It also allows the possibility of a cluster of perhaps five cabins to be supplied power from a single group of PV panels and batteries (located in a separate building, or even in a trench with a removable, insulated cover for access).

The problem is that we cannot meet NEC requirements at 120 VDC. The NEC requires circuit breakers and switches to be UL (Underwriters Laboratory) rated for a given voltage service. The only circuit breaker box rated for DC (that I know about) is made by Square D, and it is only rated to something like 48 VDC. (It is also rated for 120/240 VAC). Standard wall switches are not rated at all for DC. Go to Home Depot and look at the back of a toggle switch made for 120 VAC lighting and it will have stamped on it "AC ONLY". The reason for this is that a circuit breaker or switch must be able to interrupt a current when it is opened. Electrons will continue to flow as a switch is opened, creating an ionized path (arc) between switch electrodes. This arc can easily extend all the way between the open electrodes, keeping the current flowing even after the switch is off. In an AC system the current goes to zero twice per cycle. The ions quickly dissipate such that the arc will not be reestablished when the voltage rises. But in a DC system, the current does not automatically go to zero. The arc continues until something burns in two. The switch gets hot enough to set adjacent wood on fire.

There are technical fixes to this problem, of course. Instead of a mechanical switch, one would use a power MOSFET that can interrupt a current without producing an arc. One can use an adjacent circuit to sense current flow and turn the MOSFET off at the

set limit, when functioning as a circuit breaker. The wall switch would use a MOSFET with a 9 VDC battery and a switch to connect the battery to the MOSFET gate. The NEC is under continuous revision, with a new edition every three years, so eventually these technical fixes can appear in the NEC. In the meantime, one can only hope for a sympathetic electrical inspector to sign off on the wiring and allow occupancy of a cabin wired for 120 VDC.

There are probably other issues as well, but it should be clear that building 20 or so rental cabins for the EHS/MCS community in my low-emf gulch in Rockvale is basically impossible to do legally at the present time. I have signed a contract for the well. If it looks like it will provide adequate water, I might build a four bedroom, four bath, house with flush toilets in the gulch, which could be rented to four compatible individuals who were willing to share the kitchen. If the well seems a bit marginal, I might build a prototype cabin as small as the town will allow, with a composting toilet. This dwelling unit could be converted to what is called “Watchman’s Quarters”, a legal term for a second dwelling unit on a lot, if someone wanted to buy the lot and build their own off-grid house at some later time.

The Healthy Housing Research Institute can still do a substantial amount of research on healthy housing. The number of rental units will be severely limited, however, bad news to the many EHS/MCS individuals who really need a place to live.