

# GOING OFF THE GRID

THE HOW-TO BOOK OF  
SIMPLE LIVING AND HAPPINESS

GARY COLLINS, MS



**PRIMAL  
POWER  
METHOD**

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**The Primal Power Method  
Going Off the Grid:  
The How-To Book of Simple Living and Happiness  
(First Edition)**

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# Going Off the Grid

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THE HOW-TO BOOK OF  
SIMPLE LIVING AND HAPPINESS



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# Introduction

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## WHAT IS THIS BOOK ABOUT?

### Off-Grid Living Defined

Living without the convenience of public utilities has great rewards but also many challenges. It also means different things to different people. There is no official definition of the term, and many variations of off-grid living prevail. Here are some of the ways people enjoy this lifestyle:

**LIVING “OFF THE GRID,”** as I define it, means creating a home that is autonomous and does not rely on public utility connections, such as electricity, water, waste management, sewers, gas lines, and telecommunication and Internet services delivered via cables. Most off-grid homes are in rural areas.

As you will discover in this book, living “off the grid” doesn’t mean living like a caveman or Tibetan monk. You can be off the grid and still have a phone, Internet connection, modern toilet and shower, and appliances. You can still live in a comfortable, warm,

up-to-date home. It just takes the proper planning, which is what this book is all about.

**SEMI-OFF-GRID LIVING** means using the services of one or several public utilities but not all of them. Some rural homes are semi off grid out of necessity. For example, many houses in remote locations have public electrical services but also a self-contained (off-grid) well and / or septic system. This is the type of living I experienced while growing up. A semi-off-grid approach works well for people who need a guaranteed utility service to survive, such as someone using medical devices that require a reliable source of electricity but who still want to be as independent of regular utility services as possible.

This book will be of great use to anyone who wants to transition to a modern and comfortable yet fully or partially off-grid lifestyle. It was written primarily for people who prefer to hire contractors to help them build, rather than those who want to eke out an existence using only what the land provides. So if you want to live autonomously but still enjoy modern creature comforts and telecommunications, this book will be an excellent resource and, I hope to help you avoid many costly and frustrating mistakes in your off-grid adventure.

## OTHER OFF-GRID LIFESTYLES

Here are some topics often associated with off-grid living that this book will *not* cover:

**PRIMITIVE OFF-GRID LIVING** is for people who prefer to espouse a more primitive style of off-grid living, opting to live more like our great-grandparents might have. For example, they might live in a tiny cabin without any electricity or running water and make their own supplies and structures out of the trees and rocks present on their land. It's almost like camping, but with permanent structures, usually built by hand by the people who will live in them.

**HOMESTEADING** means living a self-sufficient lifestyle, usually in conjunction with living off the grid. Homesteaders live in a manner

similar to our ancestors who had farms. They grow their own food, preserve foodstuffs for cold seasons, and often raise animals and/or hunt for meat. Many homesteaders build modern off-grid homes and have cars, computers, and so on. If you don't want to have to go to the grocery store ever again, and the idea of hobby farming appeals, homesteading may be of interest to you.

**PREPPING** is a lifestyle carried out by “preppers.” Preppers believe in preparing for the future, and anticipating how to handle a major threat to life or disaster, either natural or man-made. Acquiring survival skills (such as homesteading), stocking survival supplies, and being able to live without the benefits of a utility grid are usually a part of this lifestyle.

I believe everyone should be able to choose their own lifestyle, and certainly there are many people who incorporate elements of several off-grid options into their homes. For example, many off-grid enthusiasts dabble in homesteading or prepping to some degree.

However, this book will *not* cover subjects related to primitive off-grid living, homesteading, or prepping in any detail. If you want to undertake one of these options, you can use this book for some planning ideas in conjunction with other resources that focus exclusively on these topics.

## The Realities of Off-Grid Home Building

So if you are still reading, it's because you want to live independently of public utilities but still be in a modern and comfortable home. You probably prefer to hire help to build the home. You might want to garden, but you'll likely also use the grocery store and restaurants as usual. You'd prefer to still have your car and enjoy your community, but you are tired of endless utility bills.

Indeed, many people want to live off the grid to get away from the hectic pace of city living or to save money. Certainly, off-grid

living offers a kind of independence, peacefulness, and personal reward that is rarely found in our overly busy, technology-driven lives.

Here's the "but"—and yes, I am afraid there is one. I'm not going to sugar coat it. Buying remote land and building an off-grid home from scratch is still, to a large degree, the final frontier of modern real estate. It's not easy, and there isn't a lot of precedent to rely on. It's absolutely not like building an on-grid home in the suburbs. An off-grid home can be a real challenge and take several years to complete. I know there are many TV shows and videos on YouTube, that make it look easy, but trust me, it will be one of the biggest self-imposed challenges you can undertake in today's world.

As you will read in this book, I opted to leave city life for a remote—and, if I may say so, amazing—property in the wilds of Washington State. When I started researching my off-grid dream, I found it very hard to find good information about non-utility-based, rural home building. What I could find was often incomplete or barely readable. So in conjunction with my off-grid evolution, I started writing this book.

I hope this text will help you avoid many of the mistakes and missteps I made. I love living off the grid, and I'm excited to pass on what I know to other people interested in a more independent way of life.

## What This Book Will Cover

If you take away nothing else from this book, you should at least recognize the importance of a pre-planning all aspects of your home before taking the leap of purchasing property or beginning to build. You must research everything thoroughly first! This includes the following topics, which form the backbone of this book.

**PLANNING FOR A LIFESTYLE CHANGE:** How can a person go from a 3000+-square-foot home in the city to a small off-grid cottage in a

remote area? It doesn't happen overnight. Chapters 1 through 3 will outline the mental and practical journey I made to do just that.

**RESEARCHING AN OFF-GRID HOME:** All through this book, I will remind you of the importance of researching and planning before you build. I will stress the importance of building everything legally and to code and explain how this critical step protects you, the homeowner. Building codes vary greatly throughout the country, and you need to safeguard your interests. Don't skip this step!

**CHOOSING AN OFF-GRID PROPERTY:** The property you buy will dictate how and what you can build, since you will be relying on that land for energy (whether solar, wind, micro-hydro, and/or geothermal; Chapter 8), water (from a well or an aboveground source; Chapter 4), and waste management (via a septic system; Chapter 5). Area topography and slope often dictate which of these systems will even work at a particular location.

Throughout this book I'll discuss why you shouldn't just blindly buy property and expect that your solar panels will get enough sun, or that your stream will provide enough drinking water, or that a building inspector will approve your septic permit. Thoughtful property selection is crucial to making it all work.

**BUILDING AN OFF-GRID HOUSE:** Here's where you can avoid a lot of headaches, and unnecessary cost overruns! I am going to give you plenty of advice on how to hire the best local contractors (Chapter 6)—and how to avoid the duds (which are plentiful, I'm sorry to say). We'll cover the pros and cons of DIY building versus hiring a pro. You'll learn about the different kinds of off-grid construction and the tools you'll need to have on hand for most basic home repairs (Chapter 11). Finally, you'll learn why I recommend building a small, regular home instead of a "tiny house," despite the trendiness of the tiny house movement (Chapter 7).

**OFF-GRID CONNECTIVITY AND SECURITY:** We'll discuss the best ways to ensure you have modern cell phone and Internet connections while still being fully off-grid (Chapter 9). You'll learn practical and affordable ways to protect your property from would-be thieves, which sadly exist in remote locations just as they do in the city (Chapter 12). We'll even discuss how to use the Internet to monitor your off-grid home remotely, so you are always aware of what is happening at your property.

**PAYING FOR YOUR OFF-GRID PROJECT:** When budgeting for an off-grid move, it's easy to make the mistake of accounting only for home and property costs, forgetting that it will cost serious money to build your water, waste, and energy systems, too. Throughout this book, I will provide realistic price expectations for each off-grid component, and list companies and websites you can refer to that can help you budget for the different elements of your potential home.

Many would-be off-gridders forget to budget for costs that exist in remote areas but that are not normally associated with city living or buying a preexisting home, such as building permits, tools, building inspections, gates and fences, creating or improving roads, sheds, tree removal, well drilling, and an upgrade to a four-wheel-drive vehicle or truck. This book will give you a clearer picture of all costs involved, so you can be realistic about your plans. Finally, I will share insider tips on how to finance an off-grid home, which is probably trickier than you realize (Chapter 10).

## The Rewards of Off-Grid Living

Let's just clarify, living off the grid is not some kind of paradise, no matter what the blogosphere tells you. Listen, if you go off-grid you will still need to pay your taxes and participate in the world. Things will still break and go wrong, and you will still have to deal with people who are incompetent and frustrating from time to time. You can't escape any of that completely.

However, the rewards of off-grid living are significant and, in my experience, absolutely worth it. You can save money, focus on what is authentic by simplifying your obligations, and live life on your own terms—isn't that the real American dream? This book was written to make the transition from a typical on-grid home to a modern, comfortable off-grid home easier and more achievable.

Whatever your reasons for streamlining your life, I wish you luck in your off-grid adventure. Having lived through that

transition and all of its potential difficulties, I can say there is nowhere I'd rather be right now than in my remote cottage, enjoying a million-dollar lake view, listening to the sounds of nature, at peace with my place in the world. In putting this book out to the world, my wish is that it helps you, in some small way, find the same peace.





# Chapter 1

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## GOING OFF THE GRID—MY STORY

So where did I get the idea for my off-the-grid project? From one of those now popular living-in-the-wild Alaska shows? Or because of some misanthropic desire to completely detach myself from society and people? Neither. The answer is pretty simple actually: because I wanted to. There are many factors, but I will begin this book by describing how I arrived at my decision to live off the grid.

First, I think it is important to understand that I grew up in a small town in the mountains of California, so what I'm doing is not as drastic as one might think. I did not go into this adventure completely in the dark. Also, this was not some off-the-cuff decision; there was a lot of thought and care that went into it. I feel it is important for people to see that even though I call it a *project*, it is ultimately a *life decision*.

During my life I have lived in many cities across the country, and as I have aged, I have become more disenchanted with and disengaged from that type of living. Not that it is a bad type of living, it's just not for me anymore.

Having grown up poor in a single-wide trailer, you would think I would not want to ever return to such a lifestyle. That couldn't be further from the truth. Having grown up that way has given me a different perspective on what I truly think is important.

Sure at times things were tough growing up, but it made me appreciate everything I had that much more. I now look back and consider myself incredibly lucky to have had these experiences. I was fortunate enough to pretty much know all the people in my town, and be able to wave at them and get a wave back in return. That is pretty much unheard of in an urban setting today.

I still have fond memories of racing home from football practice, before the sun went down, to get in an hour of bird hunting. Heck, I would have my shotgun behind the seat of my truck to save time. Yes, that would mean I had a shotgun on school grounds, and I wasn't the only one, as a lot of us did this. Most of us were hunters, and that was just all there was to it. Can you imagine what would happen to a kid doing that today?

Since leaving my hometown for college at 18, I have had very few opportunities to do the things I so enjoyed while growing up—hiking, fishing, hunting and just being in nature. For many years I have yearned to return to that type of living. It is hard to explain to someone who has never experienced such a lifestyle, but for me this way of living has always made me the happiest.

To me, the daily grind of living in congested areas has become completely overwhelming and too stressful. Why would I want to sit in traffic if I don't have to? The thought of going to the mall actually makes me cringe and uncomfortable. The fact that I didn't know any of my neighbors was disturbing. I can't tell you how many people I waved at in my old neighborhood, while on my nightly walks, and received nothing but a strange look in return, or in a couple cases, the middle finger salute (stupid teenagers). Is this really living? For me, I just don't think so.

The thought of peace and tranquility today . . . well, most people consider it impossible to obtain. At one time I thought this, too. But as I started to become more and more frustrated with today's

modern stresses, I began to think that there had to be a better way for those of us who desired a simpler type of life.

## The Search Begins

So about nine years ago, I started researching remote pieces of land, and I began investigating if it was possible to obtain a place removed from the hustle and bustle. I'll be honest, in the beginning it was pretty discouraging. Where do you start? Where is a good place to live? Could I handle a colder environment after living in sunny Southern California?

So I started by going online and looking at properties in parts of the country I was interested in, to see what they cost and what the possibilities were. During this time the housing boom was close to its peak and the land I was interested in was priced way too high.

I knew, in time, the prices would have to come back down, so I put my dream on hiatus for a while.

Fast forward to 2013, and the thought was still in the back of my mind. In that year, the stress of trying to run my own business and numerous deaths, including one of my best friends, hit home. As such, I wasn't really pursuing my dream; I was just kind of in a rut. I knew, though, that if I kept saying "I will get to it next year," it would never happen.

So with that, I rekindled the dream and put a plan into action.

Most think that living off the grid means living in a cave or shack with no running water or electricity. Today, that couldn't be further from the truth. Due to the improvements and affordability of alternative energy systems, you can now live a comfortable lifestyle on a piece of fairly isolated land.

I think the best part of this adventure is I'm doing it, financially, in a way that most Americans can afford. I do not come from a long line of millionaires, and do not have unlimited resources. I'm attempting to complete the entire project, including land, well,

septic, dirt work/ roads, and a small house for a price that should be achievable for almost anyone who has the desire to follow suit.

Hopefully you will enjoy my adventure, and even if you are not interested in such a lifestyle, maybe you will learn a little something that you can incorporate into your life to make it simpler and more enjoyable.

## Chapter Summary

Going off the grid is an individual life and lifestyle decision. City traffic, expenses, crowds, and lack of real community are some of the reasons I have chosen to return to a simpler way of living. Today, a comfortable off-grid home, complete with modern conveniences, is possible on an average person's budget. This book describes my off-grid adventure, and the lessons I learned getting there.

# Chapter 2

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## SO WHERE DO YOU START? SIMPLIFY YOUR LIFE

When you are thinking about living off the grid, or even contemplating starting a more self-sufficient lifestyle, I think you need a solid starting point. As I preach in my other publications—the Primal Power Method nutrition and exercise book series—it is always better to have a plan and to take it slowly in the beginning.

Given the expectations of our instant gratification thought process and society, many people today forget that great things come with time and perseverance.

My off-the-grid journey started several years ago when I decided to downsize and simplify my life. After owning several homes that were much bigger than I needed, and filled with crap that I would never use, I decided it was time for a change.

# Consumer Nation: Stuff Doesn't = Happiness

Until I made the decision to go off the grid, I had spent my life being just what society and the system wanted me to be: the ultimate consumer. I think it is no secret today that our lives are driven by suffering through a maximum workload to make money, and by consuming and buying as much as we can to fill the unhappiness void. Now, I'm not saying there is no value in work, and I don't begrudge working hard and earning an honest wage. But, I do think we have our priorities way out of whack.

Why do we purchase the biggest house we can obtain a loan for? Why do we buy that sports car we really can't afford? Why do we have a closet full of clothes and shoes we hardly wear? In the end, we stress ourselves out so we can obtain all these items, and for what? Exactly! You can't answer that question because there is no logical or reasonable answer.

To me the answer is simple. We do all of the above, and drive ourselves crazy in the process, because that is what we have been told to do in order to obtain happiness. So in today's society, stuff equals happiness. Trust me I followed this mantra with gusto, purchasing all kinds of junk I didn't need.

## STOP BEING A JUNKAHOLIC

So where do you start? Well, just like an addict, you stop by admitting you have a problem. I like to give the moniker "junkaholic" to the affliction most of us suffer from today. As humans, it seems like our primary goal in life is to compile as much useless stuff as we can, and then die among the heaps of our non-gloriously obtained items, hoping someone finds us before one of our pets starts eating our face. Ok, I know that is a little over the top, but I think you see my point.

Just as I said above, the starting point is realizing that your life means more, and would be further fulfilled, by endeavors other than surrounding yourself with shiny items. Their luster lasts for a very short time before you need other shiny objects to fill their void.

For me, I realized that less was more. Just like my optimal health philosophy, this path will be a little different for everyone. For some, living off the grid means building their own dwelling by hand, having no running water, and growing or raising all of their own food. For others it might mean buying a smaller house and installing some solar panels, while still others might want to be somewhere in the middle.

As for me, I wanted to live in a comfortable, up-to-date home, but downsize and simplify my life in terms of both financial obligations and “stuff” ownership. In other words, less junk, fewer headaches, and more time for what truly matters in life . . . while still living in the modern world.

The starting point for me was to greatly downsize my living space. Back then, I was paying a ridiculous mortgage for a 1,700-square-foot house in Southern California, and constantly losing sleep trying to figure out how to pay for it.

I was single and had two dogs. Why I thought I needed that much space is a mystery to me even today. Well, not really; I was brainwashed into thinking bigger was better.

In the end, all it did was stress me out, financially and emotionally . . . and make me spend a great deal of time on upkeep for the large house and property when I could have been using that time doing something I truly enjoyed.

That is one important point I want to make about our modern maximum-consumption lifestyle: Instead of making us happy, in the end it actually makes us less happy. It takes time away from those we care about and opportunities we have to pursue our true passions in life.

If that isn't true irony, I don't know what is. We spend a great deal of our lives pursuing the things that we have been told will make us happy, but in the end they make us miserable and unfulfilled. Wow, the joke is on us.

The great news is that we can change this. I want to share with you my experience and the steps you can take in order to “happify” (my made up word) and simplify!

## Evaluate Your Current Living Conditions

The first thing you need to analyze are your current living conditions. Can you get by with less living space? I would say almost everyone in this country could answer this with a resounding *yes*!

The first thing I did back then was simple; I analyzed my monthly cost of living expenses. This included my mortgage, insurance, utilities, and general upkeep expenses. It came out to an astounding \$3,500 a month.

For those of you who do not live in California, or one of the more expensive states, you are probably flabbergasted by that amount. Let me tell you, that is cheap in Southern California. Most people I know in California easily spend around \$5,000 to \$6,000 per month or more for what I outlined above. When I look back with my “what is important to me” clarity, paying these expenses was absolutely nuts.

For me, I still had about 27 years left on my mortgage, so that meant I could look forward to spending a total of \$1,134,000 (yes, that is over a million dollars) if I maintained that type of lifestyle for the remainder of my mortgage. Here is the kicker; most of us don’t maintain, we upgrade, so that total would actually go up.

Basically, we all have the capability of being millionaires if we just adjusted our lifestyles choices. That is a pretty astounding statement. Just thinking of the average person I know in California—their total would be close to double mine. I hope you are starting to see the insanity of our consumer-based economy in this country.

Most of you might think my effort to make a life change rather drastic, but I will assure you once I got settled in my new, downsized place (described below) it was anything but. As I outlined, I was living in the typical Southern California residential neighborhood in a three bedroom, two bath, two-car garage house. For a single guy, this is just way too much space. Heck, I think it is too big for the average family, and I will explain why later.



## IS RENTING AN OPTION?

After analyzing how much my house cost each month, I decided to take a look at renting and see what made sense. The first place I looked at was on Craigslist.com. It was very discouraging in the beginning, as renting in California is fairly expensive when compared with the rest of the country. Not to mention, I was looking just after the housing bubble had burst (the start of the Great Recession), so everyone was trying to do what I was doing, and the glut of prospective renters was pushing rents even higher.

The icing on the cake was having two large dogs; most rental owners really don't like pets, and if they do accept them, they almost always hit you with a significant upcharge. So what did that mean? Instead of renting in my general location, I had to cast a wider net in order to find more options. Having pets meant I had to look in more rural areas, where people didn't really care as much about renting to people who have pets.

At first I started by looking for two bedroom places, and quickly realized the price difference between what I was currently paying and the prospective rental was not large enough to justify this choice. What this made me do, was to really start looking outside my perceived comfort zone at the time. I started looking at studios, granny flats (small apartments attached to houses) and cottages (basically a studio house – all living space is in one area as with a studio apartment).

This opened up an entire new lifestyle that I had never experienced before because it simplified living far more than what I was used to. It is amazing! Having less space forces you to have less stuff, which ultimately makes you happier. Huh, I'll be honest, I really didn't see that happening in the beginning of my search.

Sometimes you might get lucky and find the place you want right away, but from my experience, making such a drastic change takes time. Here is why:

- Unless you have lived this way before, these kinds of habitations are those you have never experienced before.

- You will probably have to search in new, unfamiliar areas to determine what works best for your current situation.

Here is the key (I have discussed this in some of my YouTube videos and other blog posts): Change is always painful in the beginning, and there is no getting around this. You have to realize you are making a major life change. It is going to be uncomfortable. All great things in life come with some scrapes and bruises along the way.

My search for a rental home in Southern California took six months. I did a lot of research and soul-searching during this period, and ultimately, it paid off. I found a cottage with a full-sized yard located in a rural part of San Diego.

In the end, by being patient, it ended up being the nicest place I had found and with the lowest rent (to the tune of several hundred dollars!). The surprise was my landlords were the best I have ever had. When you take your time and are patient, a little luck will come your way.

I will emphasize that when renting you really need to evaluate whom you are renting from, just as they are evaluating you. For most, moving is not a pleasant experience, so my philosophy is not to do it more than you have to! When I moved into my new-to-me rental in San Diego, I knew I would be there for at least two years.

That is another key to think about. How long do you plan to live in this place? Can you stay long term if need be? If you own, will you be able to sell your house in a timely manner, or will you have to try and turn it into a rental?

In my situation I was unsure how long I would be there, but I made sure it was something I could do long term if I needed to. Thankfully, I thought that through because I ended up being in the cottage rental far longer than I had originally expected, four years instead of two.

I know most of you who are married and have children are going “Yeah, that is no problem for a single guy, but our situation is different.”

Yes, and no. I know families who have reduced their living area by half with no problem at all. Sure, at first they and their kids

had to get used to the new lifestyle, but once they adapted, I have not heard one complaint about not having enough space. Again, it is about facing the challenge and not giving in to the voice that says, “It is just too hard.”

Simplifying your life comes with challenges, and you have to keep your eyes on the prize at the end. More financial stability ultimately means more freedom. I’m not saying that minimizing your living space and having more disposable income is the solution to all of your life’s problems. But I can promise you this; it is easier to figure them out without additional self-perpetuated stress.

## The Payoff

The recession has not been kind to most of us. I’ll be honest, I ended up selling my house for a significant loss, but I had to make a critical choice. Let the house eventually push me into bankruptcy or sacrifice short-term loss for long-term happiness. These were incredibly tough circumstances, but I don’t regret what I did for a second. Here was the payoff for me. By forcing myself way out of my comfort zone, I found a great rental place for a great price. *I want to emphasize this is the decision I made, but I’m not a financial expert. You will have to weigh your own circumstances and make the best decision about what is best for you and your family.*

Now, I know you are asking “so, how big was the cottage?” My new rental place was around 475 square feet (based on my measurements). That is right, I went from 1,700 to 475 square feet, almost a 75% reduction in living space!

Do I recommend everyone make such a drastic change? Of course not. Again, it depends on your situation and what you are comfortable with. I will tell you this, I have no regrets and the thought of ever again living in a big house has not once crossed my mind since I made the change.

Now let’s get down to the nitty gritty—so how much did I save? I was able to go down from \$3,500 in basic living expenses

per month, to \$1,100 a month. The best part for me was not only saving a lot of money, but also not having all the stress of paying for and maintaining a large house. That was priceless.

Another bonus was that I had to sell a lot of stuff, because there was no way it was going to fit into the rental cottage. I made close to \$10,000 selling all my extra crap on Craigslist, and I sold most of it in 48 hours! I can't explain the cleansing effect this had on my psyche and life. After selling all those useless possessions it felt as if a huge weight had been lifted off my shoulders.

I give the above as my real-life experience. As most of you know from my Primal Power Method book series, I never give you advice about things I have never done myself.

I have learned that home ownership not only costs you financially, but can put you in a situation where you can get stuck. I used my time in the rental place to plot out my next move (which turned out to be this off-the-grid project!) and to make sure I would not be rushing into anything I would later regret. I know not everything can be planned for, nor does it always work out perfectly, but I like to give myself the best odds possible to avoid as many pitfalls as I can.

I can now say my patience has paid off big time. I have the property of my dreams. It's still going to be a lot of hard work, but I wouldn't have it any other way.

## Chapter Summary

Happiness in life isn't about working the most hours, buying the biggest house, or having the shiniest toys. The truth is, stuff does not equal contentment. Less is more.

I used to live in a house that was way too big for me, and it cost me far too much money. More importantly, it was—and would continue to be—a huge distraction from what I really wanted in life. However, drastic changes in life are not easy,

and take time. This includes downsizing from a typical, large home to an off-grid cottage.

However, greater financial stability equals greater personal freedom, no matter how large or small your family unit. A smaller home means less cost, less upkeep, and less stress. I encourage you to get unstuck and explore how transitioning to a smaller, off-grid home can change your life for the better.

# Chapter 3

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## HOW TO FIND YOUR OFF-THE-GRID PROPERTY

Since I started my “Off the Grid Project” many have asked me how I found my ideal off-grid property. Those who have seen it have even noted that the land and view look amazing, and I’d like to humbly agree.

But as to the question of how I actually found it . . . well, that is not an easy question to answer. It didn’t happen overnight, and there is no magic formula for finding a great place to get off the grid. As I have discussed previously, my property is unique to my wants and desires, and yours should be specific to your own goals as well.

With that being said, I think I have come up with a decent method for locating and evaluating potential properties that will work for most. If you are looking for an *easy* formula for finding the perfect off-the-grid spot, I will warn you: There is no easy way. It will take time and a great deal of work. Having said that, I hope my story and strategies will be of some use to you.

# Where My Plan Came From

My plan to finally make my dream a reality was originally hatched about ten years ago while I was living in New Mexico during my employment with the federal government. Anyone who has been to New Mexico knows there are numerous outdoor activities in the area in which a sports-inclined person may participate. In that way, New Mexico brought back memories of my childhood growing up in a small town in the Sierra Nevada Mountain Range.

By that point in my career, I had been fortunate enough to have done a great deal of traveling while working in the government. Because of this broad geographic exposure, I already had a few places I was looking at in terms of buying my ideal off-the-grid land.

At the top of my list was Washington State. This was for three reasons:

1. I love the outdoors, and Washington State has tons to offer in this area.
2. Affordability: When I compared land prices in other states, such as Idaho, Montana, and Wyoming, Washington definitely offered the most bang for your buck.
3. Washington has no state income tax. I'm not a big fan of giving the government any more money than I need to.

I had a friend who lived in Northwest Washington, and I used to go visit him once or twice a year. He lived in a fairly congested part of the state. I knew I wanted something more remote, but I just wasn't sure where. As luck would have it, after a transfer for my federal government job back to Southern California, I was assigned to assist on a case in the Spokane area in the northeastern part of Washington State.

While working there, I also met a girl, and we dated for a while. So I was able to explore that part of Washington a bit more, and it was love at first sight (with the area—not the girl, unfortunately).

Now, this was some four years after I had my original idea to eventually live off-the-grid. I had contacted a real estate agent when the idea had hit me when I'd lived in New Mexico years earlier. However, my first blush of enthusiasm quickly dampened because land prices were out of my range due to the pre-recession housing boom being in full effect. But I didn't give up. I knew the prices would eventually come back to Earth. And of course, they soon did.

## HOW I LEARNED PATIENCE IS THE KEY

There is one thing I can't emphasize enough when it comes starting your adventure with a more remote lifestyle—patience, patience, and some more patience. Again, there is no roadmap for this type of life. Everyone takes their own path and finds what they are looking for via different avenues.

The part of Washington in which I finally found my own personal paradise is littered with people who had once aspired to a rural and self-sufficient life, but who didn't do their research first, jumped in too quickly, and flamed out. Every time I mentioned I was from Southern California and described what I was trying to do, a local would give me the look like: "Yeah, right buddy. You will be gone in less than a year, if even that long."

If you have watched too many shows about Alaska on TV, and think that you can pack up the BMW (a rear-wheel-drive car in the mountains, not a good idea!) with the wife and dog, you are better off just getting your triple-shot, fat-free, sugar-free latte, not too hot, not too cold . . . well you get the idea. My advice for those folks is to just stay home and watch the Kardashians. I kid you not, I met more than my fair share of these types of individuals while staying short-term at a local hotel. These people never make it through the first winter, and honestly, they give out-of-state people working toward a better, simpler life a bad name.

So what does the above have to do with you finding your ideal, rural land, you might ask?



Here's my hard-won advice. First, you have to be dedicated to the idea of changing your lifestyle, and it should be with real intention and thought, and not just on some whim. Second, by hailing from outside the area in which you intend to build, you will have an uphill climb ahead of you just to gain the trust and respect of the locals. I will expand on this a little later, but it is incredibly important. Just remember you are not the first one to come up with this remote-living idea, and many idiots before you have made dealing with the locals in the area much harder.

## Formulating Your Plan

If you think you may want to head off the grid for a simpler and more self-sufficient life, I recommend you begin by asking yourself: Why do you want this type of lifestyle?

Do you want it because it looks cool on TV? (I do not recommend this as a valid reason!) Do you just want a simpler life? Do you want a remote vacation house to get away from it all?

Everyone will have their own motivations, but this soul-searching has a concrete point. Moving away from urban areas has to be something you must truly want to do and a lifestyle you really want to adopt.

There are many variations in what "living a more remote lifestyle" looks like in practice. However, the process of finding an ideal piece of land upon which to build your new home will be similar no matter what your preferences. The only thing that will be different is how remote your piece of property will be.

For me, the best way to start was by traveling to various parts of the United States to see what places I liked most. I needed to come up with a short list of potential locations. I have been fortunate and have spent a great deal of time traveling for my job. But for many people, this may not be a possibility. For those who have no idea where to start, I would begin by looking on the Internet

for states or areas that have what is on your wish list (climate, land features, state taxes, laws, and so on).

Once you have five to ten locations in mind, search the Internet for land for sale in those places to get an idea of the size of the lots that are available, and what the price range for real estate generally is in that area. A website I like to use is [www.realtor.com](http://www.realtor.com), as most types of properties for sale are listed on this site. Of course, don't rely exclusively on this type of search. This is just to give you an idea if what you are looking for is affordable and/or available.

After narrowing your locations down, the hard work begins. I would keep the list to five states (or areas) or fewer, if possible. Just like anything in life, you have to experience it first hand in order to figure out if it is the right thing for you. I planned my vacations in the areas I was interested in, so I could explore the vicinities further.

Now, don't make the mistake I made, which was jumping right in and contacting a real estate agent who happened to be listed on one of the properties I found interesting. Trust me, this type of blind Internet-based fishing expedition for a Realtor is a complete waste of time. The best way is to visit the area yourself, then find a local real estate agent who is either from (or at least very familiar with) the area you think fits your needs.

Eventually I figured this out. The right way looks like this: I did all my research first, so I knew exactly what I was looking for, and then found a real estate agent local to the area. If you try to use a real estate agent too early in the process, you will end up looking at land they want you to buy instead of the other way around.

I wasted days going to dumpy, unbuildable lots, with a real estate agent who was not well versed in the type of property I was looking for. Lesson learned! At this point I realized I needed to do my own homework first, rather than relying on the real estate agent to do it for me. As you can imagine this was a really bad idea.

Keep in mind also that some remote lots are not listed, as they are "for sale by owner" only. Your local real estate agent will probably know about these lots, or other people in the area will know of someone trying to sell some land that is not listed.

## How I Adapted and Changed My Plan

After this failure, my new plan was to spend three to four days traversing the area in which I was interested by car. Take my advice: This is the best way to figure out if that region suits your needs, hands down. I put about 1,000 miles on my rental car in three days. But I'll tell you what, I knew exactly where and what I wanted after that.

Once I had narrowed down my search to a specific place, I needed to find a good local real estate agent.

During this time, I had been getting to know the locals in the town in which I was staying. I asked everyone I could about land, and if they knew anyone who had property for sale. This approach didn't get me any new leads on lots for sale, but it eventually led me to the right person to get the ball rolling.

Someone told me I should go to the local bank, and see if they had any foreclosed or short sale properties they were selling. Now, this was an excellent idea, so with my newfound enthusiasm, I headed off to the local bank. I ended up speaking with the vice president of the branch, and asked if they had any land for sale. They didn't, but she knew a realtor at one of the local real estate offices who specialized in the type of land I was looking for. One better, he resided in the same area in which I was considering buying.

It was pretty funny. I didn't even have to get in my car to go to the real estate office. I literally walked two blocks from the bank, and I was there. After introducing myself, and outlining my master plan, he said he thought he knew of a property that was exactly what I was looking for. Of course I was a little skeptical because the last real estate agent had said exactly the same thing. But after he brought up the listing on his computer and showed it to me, I was inclined to think that he just might be right. In addition, he found another lot not too far away from the first one that he thought could work as well.

We made a plan to meet early the next morning and head out to take a look. So the next morning, I met up with my new real

estate agent, and we went to see a 20-acre secluded lot with a view of a nearby lake (which was one of my absolute requirements for my property).

After weaving through an old logging road for about 45 minutes, we emerged onto the property. It was land still owned by the logging company that had worked the area years back. I mention this because early on I had been discouraged from looking at these types of lots, which I now know is a huge mistake.

## **TURNING A NEGATIVE INTO A POSITIVE**

My first real estate agent—way back in New Mexico—wouldn't give me logged lots to look at. His rationale was that such spots had been stripped bare of trees. His opinion was that, for someone like me, who wanted to live in the forest, a lack of trees wouldn't make much sense.

Now, this may seem to be logical at first glance, but the opposite is actually true. Let me explain.

It is true that some logging lots have been stripped bare, but I have found this is not always the case, especially with smart lumberjacks on the job. The logging company from which I bought my lot has a business model based on reselling land. They selectively cut trees, which keeps the forest in a condition ideal for someone who wants to develop the land or make a homestead. Pretty smart I would say. A savvy logging company can make money off the trees, then make money selling the lots if they do it right. So now you know.

The logging company that had once owned the lot I eventually purchased had left me plenty of trees, as it turns out. They cleared most, but not all the good ones. The left trees that were not profitable for them to cut, but they were great for someone like me, who was looking to build a house in the woods and live on the property.

Now, here is the real genius in their plan. A logging company has to build a "landing" at its worksites. The landing is the spot where all the heavy logging equipment is placed and the trees are de-branched, de-barked, and prepared for transport. In the case of

the company that had worked what is now my land, they cleverly opted to build the landing in the spot they thought would be the best building site for a future house.

This was great! The buyer (me!) would have far less work to do, and much less dirt to move, in order to make the lot house-ready. By selectively clearing the trees, the property was appealing to a buyer, instead of seeming like a barren scar.

Most people who looked at the lot before me couldn't see the potential, because most real estate agents don't have a clue how to develop such a property. Not my local real estate agent! Both of us walked the property, and saw all the potential, not to mention how much of the hard work had already been done.

Here is what we could see:

- The building site was already established in the best location, and was flattened and settled. It would take minimal work to finish. (This is especially important when dealing with sloped land, like on a mountainside.)
- Because the trees had been selectively cleared already, I wouldn't have to remove literally hundreds of trees to make the property buildable. Plus, substantial amounts of work had already been done by the logging company in building roads that granted access to the site.

Tallying up the combination of earth-moving and tree removal, I saved probably around \$100,000 and weeks, if not months, of extra labor.

Here is another very important point that most potential buyers saw as a negative but was actually another big positive. The lower portion of my property had transport power lines running through it. Now these weren't the type of power lines I could tap into for electricity, but the industrial-grade kind that transport high voltage electricity to other parts of the state. Most people would look at these and think "no way!" But that would be a big mistake.

First, they were far enough away and below the living area to not be a concern (you can't see them from most of the property).

Second, the power company had to maintain the road used to service them, which went through the lower part of my property as an access road. The power company road leads almost all the way to my upper building area . . . that complimentary, ongoing road maintenance is a big-time bonus!

Here's a critical point. If you have only lived in a city, you have probably only driven on public roads, maintained over the years by local or state governments. You may not even have heard of private roads. But in many rural areas, roads are private, meaning the people living on them must pay for and arrange for their maintenance. Building, and especially paving, a road is expensive . . . to say nothing of fixing the inevitable potholes, cracks, and erosion that appear over time. Plus, you would in theory have to share that cost equally with all your neighbors, which can be hard to arrange.

So I was doubly thrilled that, by the time I had bought the land and come back to begin building my home, the power company had completely re-done the road, and they did a great job! This left me with only about 200 yards of road that I needed to fix. That saved me probably another \$10,000 and years of work because the road was rough but drivable in a truck with four-wheel drive.

## THE UPSIDE OF BEING FLEXIBLE

I know what you are thinking, "Gary this all sounds great, but how much did this amazing piece of property cost you?"

Here's the best part. It was a great price because no one had seen through all the supposed negatives. I bought 20 acres of gorgeous mountain land for \$23,000. No, there is not a misplaced comma—that is twenty-three thousand dollars. That is far less than what most people pay for their yuppie, I'm-really-cool, competing-with-the-Jones' sports car they really can't afford.

As I've said before, a little luck helps in the process, but I wouldn't plan on getting lucky. I had already planned on how to deal with the road issue, but fortunately I didn't have to. That was my lucky break.

You can see that by being patient and doing research, I had made something that seemed impossible for the Average Joe become a reality. I hope my story helps you save some of the time and effort I wasted and that you find your dream land soon.

## Chapter Summary

Patience is the most important quality and research is the most critical activity when searching for off-grid land. Be sure you can commit time, energy, and resources to your project over several years. Create a wish-list of what you are looking for in terms of weather, topography, state laws. Don't forget your land will dictate which alternative energy systems and home building techniques you can use, so create a wish-list of home and system features you want as well.

To search for land, actual travel and virtual research via the Internet are both great tools. Consider vacationing in the place you wish to live eventually to ensure it's right for you. Do all of this before contacting a local Realtor. This kind of homework will save you lots of time and money.

# Chapter 4

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## FIRST THINGS FIRST: THE IMPORTANCE OF WATER AND WELL-WATER BASICS

If you want to live off the grid or in a more remote location, your first and biggest problem will be how to access water. As basic as this seems, you would be surprised how many people ignore this simple, yet necessary component in the off-the-grid/survivalist lifestyle. We are so used to turning on the faucet and getting instant water that we forget how precious this resource is and how hard it is to get when not connected to the public utility system.

When I started looking for my land several years back, the first thing I would always focus on was access to water. Access can be attained from any of several possible sources, such as a creek, river, pond, or (most frequently) a well. It is always nice to have a natural water source on your property, but this is not usually the case. It's more than likely that you will drill a standard well to get the faucets going, so wells will be a major focus in this chapter.

The bottom line is that without a reliable water source on your property, you have nothing but an expensive camping site. I know people who haul water to their property on a regular basis in



trucks because they don't have reliable access to water (and others have none at all). To me, that is more work than it is worth. Why not focus on buying a property that can provide a constant water source of some kind, instead of settling for an unreliable, expensive, and time-consuming system of carrying water to your land.

Here's the caveat: As I write this, due to the extreme droughts throughout the United States and especially in the West, wells have become increasingly popular. Of course due to supply and demand, that means that the costs for well-drilling services are skyrocketing, and it may be a while before you can get an available company out to your property.

Even worse, many new drilling companies are popping up with minimal experience and even fewer scruples. These so-called professionals will gladly take your money but in the end just rip you off. That is the nature of the beast: once a somewhat pricey service becomes popular, the dishonest crooks come out of the woodwork to cash in. So be careful when hiring a drilling company. I will discuss some ways to avoid getting scammed later.

Of course, there are also properties for sale that have a well already drilled and a pump installed and ready to go. Now, these properties do sell at higher premiums, but if you don't want to deal with the complications of drilling a well on your own (or paying to dig a dry well—a worst-case scenario), then paying a bit extra for a property with a working well and pump is a great way to go.

We will now turn our focus to the basics of water wells, as that is the most common water supply people will use when living off the grid.

## **What Is a Water Well and How Does It Work?**

A water well is simply a hole dug or drilled into the ground that provides usable water for a property or homestead. We will be focusing on a drilled well excavated by a professional company. Can this be a “do-it-yourself” project? Sure, but for most of us this

just isn't realistic. Thus, I will focus on how to hire a professional company to provide your property with a reliable water source.

## **REQUIREMENTS AND EXPECTATIONS FOR WELL DRILLING**

So what do you need to get water from deep underground? First, a well-drilling company will bring a drilling rig, which is a large truck that will use metal pipe to drill down in the ground until a water source is reached. These tend to be very heavy, large vehicles. They need to be larger if the projected difficulty of finding underground water increases, so having good access roads is vital for your well to be drilled.

Indeed, you should never underestimate the importance of road accessibility for jobs that require heavy equipment. You can see the difficulties I had on my YouTube page: [www.youtube.com/primalpowermethod](http://www.youtube.com/primalpowermethod). Because my roads were very steep and had loose fine dirt, the drilling rig had to be towed to the drilling site with a bulldozer. To avoid such problems, if your property is difficult to access, make sure to do a full site check with the company you plan to use. If the drilling pros believe their truck will have difficulty on your roads, ask if using a bulldozer to tow the drilling rig is permitted. These drilling rigs are very expensive pieces of equipment, and some companies will not allow them to be towed to a drilling site because of possible damage. It's always better to know in advance!

A common drilled water well consists of a drilled hole, a casing to line the hole so it does not collapse (usually a sort of pipe about four inches in diameter that reaches down to the bedrock), an electric-powered pump (needed to pump water from within the well to the surface), and a well cap (which stops contaminants from entering the well). Expect to pay from \$40 to \$50 per foot of drilled well depth for all the previous listed components. This is a general guideline, and will obviously change depending on numerous factors, but I have found this to be a fairly consistent cost estimate for a professionally drilled well.

The well hole is simply a hole drilled into the ground by a drill bit attached to sections of pipe. However, these are not the same kind of wells your great-grandparents may have used back on the farm. Have you ever seen an old-fashioned well with a bucket on a rope attached to a winch? An outdated well like this might be 20 or 30 feet deep, and it would reach water caught in deep layers of mud . . . so yes, it was not always very sanitary or pleasant to drink, but it was what was available in simpler times.

In contrast, a machine-dug modern well is very deep, sometimes reaching hundreds of feet below the surface (my well is 510 feet deep). This lets you reach water that has passed through the layers of dirt on the Earth's surface and has filtered down to the hard bedrock beneath. This water is very clean and pure and is exquisite to drink. In fact, once you taste fresh well water you will hardly be able to believe you drank city water for most of your life!

Note that the depth needed to find fresh water in bedrock depends on the geology of your area. In some places in the country, you will need to dig 800 feet or more to hit water reliably; other places require only a couple hundred feet. Well-drilling professionals will typically be able to tell you how deep they usually need to dig in your area to hit bedrock, which is an important number for budgeting since you are charged per foot of drilling.

Also ask about success rate: if you live hundreds of feet above a plentiful underground aquifer, it will be easy to drill for water. However, some areas have water running in cracks in bedrock, which must be blindly targeted from above ground to hit water. Success is not guaranteed. In such cases, if water is not discovered the first time, you may have to pay to drill more than once on your property, and once the entire length of the drill shaft has been sunk and no water has been found, you need to start over.

Indeed, with a modern well, drilling goes as far down as required until an adequate supply of water is reached. Supply is measured in gallons of water per minute (the amount of water measured when pumped from a given well). There is no absolute on what is considered an adequate amount of water by the above

standard, this is completely dependent on your needs and expectations, such as how many people will be living in your house.

A workable well usually needs to produce a minimum of one gallon of water per minute. Now, I know you are thinking that is not very much water! How would you even be able to take a shower with that low of an amount of water? We will discuss this idea in a moment. But first, I'd like to share my tips for picking the right people to drill your well.

## Choosing a Well-Drilling Company

Considering access to water on your property is going to be key to the success of your off-the-grid lifestyle, choosing a good well-drilling company is very important. In fact, I spent months researching local companies, and getting quotes for drilling my well. This is not an area venture you want to mess up, which is why I'd like to share my hard-won advice about the best way to choose well-drilling professionals that will do a good job.

Here's how it played out in my experiences. I moved states to go off grid, and unfortunately, I found not being from the area made it even more difficult to get a good well team. I decided to use the tried-and-true method of getting three different quotes from local drilling companies. I picked one large company out of a neighboring big city, and then two small, privately owned companies closer to my property.

Just as when I went about hiring general contractors (a topic we will cover in depth in another chapter), I proceeded with great caution. I did not hear anything negative about the two small companies, which was a good sign, but I had to take that with a grain of salt, since contracting companies of all kinds can be notoriously unreliable.

The two smaller companies ended up giving a lower quote than the bigger company, but not by a significant amount. Even though the larger company had a higher estimate, I decided to hire them to drill my well. Here's why:

- They have been in business for almost 25 years.
- They had the most experience drilling wells in my area and in remote areas.
- They had—by far—the best equipment.
- I knew it was probable that I would need a relatively deep well, and they had a drilling rig large enough to handle digging a very deep well quickly and efficiently.
- I knew the odds of them being in business over the long haul were far higher than the smaller privately owned companies, due to their reach, history, and breadth of established client base. This was important should something go wrong with my well in the future.
- They demonstrated the most knowledge and understanding of my unique project.
- They had no problem with the difficult roads and remote location of my property.
- They were very easy to deal with, and explained the entire process to me in a way that was helpful and proved that they knew what they were talking about.

Fogle Pump ([www.foglepump.com](http://www.foglepump.com)) is the larger company I ended up going with. They are exclusive to the NE Washington and NW Idaho areas, and I'm not sure how far they travel for drilling services. However, I thought I would mention them for anyone who might be looking to drill a well in these areas, since I have had nothing but a positive experience with them. To this day, they have been incredibly responsive to any questions I have had. In addition, they handled all the permitting and water testing requirements for my county, so it was a very painless process.

In the end I was glad I went with Fogle Pump, because my well ended up being 510 feet, which is pretty darn deep. They knocked it out in two days, which is also really good, because they had a powerful drilling rig that could do the job. If I had hired the smaller companies their smaller rigs would have taken much longer to reach that depth.

As you all know, I'm all for supporting smaller, local companies, but in this case it was better to go with the bigger business that had more experience dealing with my type of property. If my land was not at the top of a mountain, and hadn't require the depth of drilling that it had, I would have had no problem going with a smaller mom-and-pop company. As always, the right choice for you should depend on your unique situation.

## **UNDERSTANDING GALLONS PER MINUTE AND STATIC WATER LEVEL**

No matter how professional your well-drilling team is, it's important to know that not all wells deliver the same experience at the faucet.

Some wells have a larger capacity, are more powerful, and refill more quickly than others, creating a faster, more reliable, more powerful flow of water at your kitchen sink. Some are the opposite, and lead to unreliable and weak water flow out of your taps. Because of this, it's important to understand the measures and terms used to describe how effective and powerful a well is, so that you can make an educated decision on whether you need supplementary systems to boost the effectiveness of your well-water delivery.

**STATIC WATER LEVEL:** Once you drill the well, water will typically rise upward = from the absolute bottom of the well to some distance well below the surface and then stay there. This is called the static water level, and it is measured as the distance from ground level down to the water in your well. It's the "resting" level of water when you are not pumping and haven't pumped recently. The official static water level is usually measured after twenty-four hours without any pumping activity in your well. The drilling company will provide this number to you in their final report.

For example, my well is 510 feet down to the bottom, and my static level measured at 235 feet. This means that, after twenty-four hours of non-usage, 275 feet of my well shaft is filled with water, which is pretty good. Remember, your static water level is

important because this reflects how much water the well shaft can store for you.

However, in terms of production, my well is on the low (dry) end, and produces only three gallons per minute. But even though my gallons per minute is not especially high, my static level is. This means that, overall, it's a good well. Why? The odds of me using 275 feet of resting water in the well shaft in a short time period, on top of my 3 gallons per minute, is highly unlikely. Remember, the well refills itself slowly over time.

What if I wanted an even more productive well? We could have continued to drill, to get better gallons per minute, but in my case, my needs did not require me to do so. Remember, if you are going to live a simpler lifestyle you are not going to be watering lush lawns nor will you have extravagant landscaping that will take vast amounts of water to maintain. Plus, if you plan to be completely off the grid, don't forget that a well pump needs electricity. In order to get that water to the surface, you will be draining your off-grid power system stores. Very deep wells typically require the most powerful pumps to push the water to the surface, so there exists a very practical trade-off between depth (and cost) and ongoing power requirements that you will have to consider.

Sometimes deeper drilling does not yield great results, and it can be costly to start over and drill again at another site. Fortunately, there is an alternate solution if you find you are not able to get adequate amounts of water from your well because of low gallons-per-minute rates: a water storage system.

**A WATER STORAGE SYSTEM:** A water storage system is exactly what it appears to be: a place where you store water pumped up from your primary water supply to use later. Note that it is not a water pressure or rainwater collection system; we will discuss these in depth later.

A water storage system consists of a plastic or metal tank with anywhere from 500 gallons to 2,500 gallons of available storage. The system uses a pump to move water from the well shaft into the storage tank for later use. So if you have a low rate of water

flow (low gallons per minute) this is inadequate for your water-use needs, this is a simple yet effective solution.

Water storage systems are energy efficient, since the pump does not have to run continuously. In contrast, it kicks on every time you use water. This allows the pump to run enough to fill the tank then shut off. The benefits are reduced power usage and less wear and tear on your pump.

These systems range from the very simple to the very complicated. If you want a hands-off approach, a small float within the storage tank can automatically trigger the pump, thereby refilling the storage tank to a specified level without any extra effort from you.

In contrast, the simplest and most cost-effective method for off-gridders to ensure a constant water supply is to use gravity to carry the water to the house or dwelling from the water storage tank. If you use this method, you will, of course, need sloping land.

Finally, you may need additional pumps or another tank system, known as a water pressure tank, depending on how much you need to boost the water pressure available from the well. This type of pump and store system can be used for other types of water sources—river, creek, pond and lake.

## **MOST EFFECTIVE WAY OF MAINTAINING CONSTANT WATER PRESSURE IN HOUSE**

Many off-grid homes will benefit from a system designed to maintain constant water pressure, since we all like to have water come out of our taps instantly when we turn them on. A **water pressure tank** is simply a small tank system usually in the 20 gallon (small) to 85 gallon (large) range. It has a consistent pressure level for small uses of water in your house, such as washing your hands, brushing your teeth, or doing the dishes. Now, if you like taking long showers or doing large loads of laundry, you should get the largest water pressure tank possible. You can also set up multiple water pressure tanks if you are a heavy water user.



These tanks are used to keep water pressure more consistent. Thus, a big benefit of the pressure tank is “instant” water: Using a well pump alone, it takes some time for the pressure to kick in and you may find yourself waiting a bit after turning on the faucet before water appears. In contrast, with a water pressure tank, you turn on the faucet and water is always there because it is at a constant, monitored pressure.

Water pressure tanks also decrease wear and tear on your well pump, so having one is a good economic decision. Why? Without a water pressure tank, your well pump will need to kick on every time you use any water at all. So a water pressure tank will save you money, since well pumps are not cheap; they usually cost in the range of \$2,000–\$2,500, not including installation. However, the less you use them, the longer they will last.

The bottom line is that your water usage is directly tied to costs, even when living off the grid. If you are able to get by with shorter showers, opt not to water the lawn, and don’t unnecessarily run your faucets, you will extend the life of your water access system and make things cheaper for yourself in the long run. I like this approach as I believe getting off grid is about a simpler, more streamlined approach to life.

## Additional Water Storage

In some circumstances, you will need more water. For example, if you want a garden and plan to grow your own food, or even start a business selling the foods you grow, a secondary water source will be helpful. For such circumstances, a rainwater collection system is a great solution. Not only will you have an additional water source (the rain) outside of your primary water supply system, but by using a rain water collection system to water crops or maintain landscaping, you will drastically reduce the wear and tear on your water pump.

So how does a rain water collection system work? It's pretty simple: You simply collect the rainwater from your roofed buildings via a typical rain gutter system that directs the collected water into a plastic or metal storage tank.

Obviously, if you live in a part of the world that doesn't get very much precipitation, this is not a viable solution. On the other end of the spectrum, certain areas get so much precipitation, people use rainwater collection only. I have seen off-grid houses in Hawaii, for example, that exclusively rely on rain as a water source, and don't have a well system at all.

A final note: Remember if you are going collect rainwater, you will need to have an overflow system in place that will divert extra liquid away from the tank and your dwellings once the former is full. The last thing you want is to create water damage on your structure!

## Water Filtration and Purification Basics

If you live off grid, you should consider getting a water filtration and purification system. There are many options, depending on the quality of your water and your personal standards.

### THE DIFFERENCE BETWEEN WATER FILTRATION AND PURIFICATION

Essentially, purification keeps your water safe, while filtration keeps unwanted materials (think dirt and sediment) out of your water.

#### FILTRATION

A water filtration system can filter out either sediment or carbon. Most filtration systems today perform both functions. Most also block protozoa (i.e. *Cryptosporidium*, *Giardia*) and bacteria (i.e. *Salmonella*, *E. coli*), but might miss small viruses or pharmaceutical chemicals that have contaminated water supplies. Sadly, chemicals from pharmaceutical drugs are commonly found in

today's city drinking water. This is why it's important to filter your water.

### **PURIFICATION**

Water purification is a process that removes specific unwanted materials from your water, such as organic pollutants and chemicals. Basically, purification is an extra step that makes your water safer to drink. This is why I like the Berkey (which we will discuss more later) for drinking water, as it is rated as a purifier.

## **THE IMPORTANCE OF FILTRATION AND PURIFICATION**

Now, some people forgo any type of water “cleaning” system when going off grid. I disagree with this approach, since not filtering water—even well water—leaves you at risk of ingesting harmful bacteria or other pathogens. Plus, it is almost impossible these days to find a clean pristine water supply, what with all the dumping of harmful chemicals on the Earth and the tainting of our waterways.

A water purification system is also a practical consideration, since your county will likely require you to test your well water for possible contaminants. This test helps create a detailed report about the quality of your water. Wouldn't you rather know what you are dealing with?

Here's my bottom line, speaking as a public health advocate: The days when humans had the ability to deal with the microscopic organisms in water are a thing of the past, unfortunately. I definitely recommend you filter and purify any type of water you use for your off-grid property.

I do recommend you filter well water, but it's especially important to filter and purify water exposed to outside elements, such as rainwater, streams, lakes or ponds. Here are some more details about systems that I have either researched or used.

## **THE SIMPLE AND MOST ECONOMICAL SYSTEM**

The simplest and cheapest system is a high-quality shower water filter, combined with a separate portable drinking water purification

system. I like purifiers from Berkey Filters ([www.berkeyfilters.com](http://www.berkeyfilters.com)), which are relatively inexpensive and effective.

Cheaper filters are also available. I recommend a good quality shower filter at the bare minimum, and ideally a good quality drinking water filter as well. Why bother with a shower filter? Your skin is the largest organ of your body, and in contradiction to popular belief, it can absorb harmful chemicals and microorganisms, which may pass into your bloodstream. In fact, the damaging chemicals you can incur via your skin and lungs (from the water and steam in the shower) can surpass the possible harmful effects of unfiltered drinking water.

I have used the Aquasana shower filter in combination with the Berkey drinking water purification system as a cheap and easy solution for my travel trailer with great results. This combination can also work as an off-the-grid water filtration/purification system for a home. This type of system is very economical; it runs in the \$250 to \$350 range using the smaller Berkey system.

Berkey has a great Frequently Asked Question section (FAQ) for information on their systems:

<http://www.berkeyfilters.com/berkey-answers/berkey-water-filter-faq/>

The downside to this combination is the water coming through the Aquasana shower filter is not purified, so it is possible for pathogens to pass through it and to still be absorbed through your skin. More expensive systems can take care of this.

## **WHOLE-HOUSE FILTER/PURIFICATION SYSTEM**

A whole-house filtration and/or purification water system is a central system that treats water before it reaches any faucets or appliances in your home. It is located between your outside water source (such as a well) and your inside water outlets.

Whole-house systems cost quite a bit more, but some people prefer them, as they filter and/or purify all of the water entering the house. These systems can range in cost from several hundred dollars to thousands of dollars.

A basic whole-house water filter system consists of the following three filtering systems or stages:

- Stage one removes sediment
- Stage two removes chlorine and heavy metals
- Stage three is usually a heavy-duty carbon filter for removing hormones, drug residues, chemicals, pesticides, and herbicides

Note that the above system is a filtration system example only. In order to purify your water, you will need an additional, ultraviolet purification system.

Ultraviolet water purification lamps produce UV-C or “germicidal UV.” This is radiation that is much more intense than that of sunlight. Most ultraviolet purification systems are combined with some type of filtration system, since UV light is only capable of killing microorganisms such as bacteria, viruses, molds, algae, yeast, and oocytes.

UV light generally has no impact on heavy metals or other chemical contaminants. Nevertheless, it is arguably the most cost-effective and efficient technology currently available to off-gridders, and it will help eliminate a wide variety of biological contaminants from your water supply.

UV water treatment offers many advantages. It does not introduce additional chemicals to your water, it produces no byproducts, and it does not alter the taste, pH, or other properties of the water. It helps create safe drinking water, yet is not harmful to plumbing and septic systems.

Certainly there are other systems that can be used for filtration and purification. However, I have found the above-described system to be the most efficient and economical. I spent weeks researching every solution possible, and the more time I spent on it, the more confused I became. Finally, after a ton of research, and after talking with people who had been living off the grid for a while, the aforementioned solutions, are the two options that I found make the most sense.

# Water Rights and the Difference between Surface and Below-Ground Water Sources

If you are going to go off grid it is important to have a basic understanding of a legal concept known as water rights. Why? Let's say, for example, you bought a property with a stream running down your hillside with the intention of using it as a water and energy source. In this case, it would be disappointing if your neighbor further upstream on the hill, whose property contained the source of the stream, decided to divert it in a completely different direction, leaving your land completely dry.

Could they legally do that? Who has the right to use or alter surface (above-ground) bodies of water? Can someone upstream significantly change the nature of a flowing water source? The answer to these questions will vary from state to state, and demonstrate why it's important to have an understanding of water rights before you go off grid.

A water right is a legal entitlement designed to protect the use and enjoyment of bodies of water. Water rights can also govern who gets to divert water sources. Now, I could write an entire book about water rights alone, but this section will give you a basic understanding of the topic, and how water rights weighed into my decision to use a well as my water source.

First, some personal history. I grew up in the Owens Valley in California, much of which is hot and arid, meaning water access and droughts are ongoing problems. The land of my youth has a rich history of fighting Los Angeles over water rights and use (a conflict known as the California Water Wars).

The Owens Valley was once a beautiful, lush ranching and farming area, but is now a dry, parched desert. The drama that led to this massive change has heightened my sensitivity to water rights in general. Besides the economic and cultural loss, the paucity of water in the Owens Valley led to dust storms that blew alkali dust off of the now dried-up Mono Lake. This caused me,

and many others, health problems while living in the area. I relate this sad story to remind you how important water rights can be.

Because I had witnessed the potential problems associated with water-rights issues when dealing with above-ground waterways (streams, rivers, and such), I decided to buy a mountain-side property with views instead of a valley property with streams. I also decided to use a well as my primary water supply.

I know people who have been in long term battles with the city, county, and other property owners over above-ground water supplies. Not to say this is an everyday occurrence, but it does happen, and should at least be considered when it comes to your off-the-grid property decision.

However, water rights also apply to below-ground water sources, which is important if you install a well. Per *encyclopedia.com* (with my italics):

Three theories of underground water rights have evolved. The first theory, known as the absolute ownership theory, derives from English law and affords landowners the right to withdraw as much underground water as they wish, for whatever purpose, requiring their neighbors to fend for themselves. Under the second theory, known as the American rule, *landowners may withdraw as much underground water as they like* as long as it is not done for a malicious purpose or in a wasteful manner. This theory is now applied in a majority of jurisdictions in the United States.

The laws concerning above-ground water get very complicated, and are more restrictive. With my libertarian mindset and beliefs, I wanted the most reliable legal water-source solution, and the one that encompasses the least government interference. For me, this is a well.

This is not to say wells do not have problems. They can dry up, and they are not devoid of government interference and regulations, but they do have some definite benefits when compared to the subtle challenges of the law that can apply to above-ground water sources.

For example, in this summary from the legal section of the [free-dictionary.com](http://free-dictionary.com) you can see how complicated above-ground water rights can be:

An owner or possessor of land that abuts a natural stream, river, pond, or lake is called a riparian owner or proprietor. The law gives riparian owners certain rights to water that are incident to possession of the adjacent land. Depending on the jurisdiction in which a watercourse is located, riparian rights generally fall into one of three categories.

First, riparian owners may be entitled to the “natural flow” of a watercourse. Under the natural flow doctrine, riparian owners have a right to enjoy the natural condition of a watercourse, undiminished in quantity or quality by other riparian owners. Every riparian owner enjoys this right to the same extent and degree, and each such owner maintains a qualified right to use the water for domestic purposes, such as drinking and bathing.

However, this qualified right does not entitle riparian owners to transport water away from the land abutting the watercourse. Nor does it permit riparian owners to use the water for most irrigation projects or commercial enterprises. Sprinkling gardens and watering animals are normally considered permissible uses under the natural flow doctrine of riparian rights.

Second, riparian owners may be entitled to the “reasonable use” of a watercourse. States that recognize the reasonable use doctrine found the natural flow doctrine too restrictive. During the industrial revolution of the nineteenth century, some U.S. courts applied the natural flow doctrine to prohibit riparian owners from detaining or diverting a watercourse for commercial development, such as manufacturing and milling, because such development impermissibly altered the water’s original condition.

In replacing the natural flow doctrine, a majority of jurisdictions in the United States now permit riparian owners to make any reasonable use of water that does not unduly interfere with the competing rights and interests of other riparian owners. Unlike the natural flow doctrine, which seeks to preserve water in its original condition, the reasonable use doctrine facilitates domestic and commercial endeavors that are carried out in a productive and reasonable manner.

When two riparian owners assert competing claims over the exercise of certain water rights, courts applying the reasonable



use doctrine generally attempt to measure the economic value of the water rights to each owner. Courts also try to evaluate the prospective value to society that would result from a riparian owner's proposed use, as well as its probable costs. No single factor is decisive in a court's analysis.

Third, riparian owners may be entitled to the "prior appropriation" of a watercourse. Where the reasonable use doctrine requires courts to balance the competing interests of riparian owners, the doctrine of prior appropriation initially grants a superior legal right to the first riparian owner who makes a beneficial use of a watercourse. The prior appropriation doctrine is applied in most arid western states, including Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming and requires the riparian owner to demonstrate that she is using the water in an economically efficient manner. Consequently, the rights of a riparian owner under the prior appropriation doctrine are always subject to the rights of other riparian owners who can demonstrate a more economically efficient use.

Under any of the three doctrines, the interests of riparian owners are limited by the constitutional authority of the state and federal governments. The Commerce Clause of the U.S. Constitution gives Congress the power to regulate Navigable Waters, a power that Congress has exercised in a variety of ways, including the construction of dams. In instances where Congress does not exercise its power under the Commerce Clause, states retain authority under their own constitutions to regulate waterways for the public good.

The ongoing drought issues in this country suggest to me that water will become an increasingly valuable resource. Almost everyone has seen their water bill rise dramatically over the last few years, all while having to deal with government-imposed restrictions on usage. Water is not an unlimited resource. I would rather have the maximum control over this valuable resource in my own life, and at this time, having access to well water on my property is the best solution.

The downside is a well will cost you more than an above-ground water source because you have to drill for it. However, anything in life that comes with more freedom always comes with a cost . . . in this case, one I am willing to pay.

## Chapter Summary

Before buying land, consider how you will get fresh drinking and tap water for your home. A modern, machine-drilled well will be a critical component of most off-grid homes. Not all sites are suitable for drilling, so you should get a professional consultation about the viability of your proposed building site before buying and before drilling. Have an access plan in place, so that work trucks and heavy machinery required for well drilling will be able to reach your home.

Not all wells are sufficiently productive. There are various technologies available that can enhance water storage and production. Consider the costs of these in your overall home budget. It's important to filter and purify your well water. Finally, be aware of how local laws impact your water rights, especially if you plan to rely on an above-ground water source for fresh water.

# Chapter 5

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## UNDERSTANDING OFF-GRID SEPTIC AND SEWAGE DISPOSAL

### **Your Poo and Pee Have to Go Somewhere**

One of the most confusing topics concerning off-the-grid living is dealing with human waste and its proper disposal. Remember, being off the grid means you are not going to have access to a city's sewage and waste disposal system. You are going to have to figure out another solution that fits within your city/county zoning and code regulations. This chapter will discuss the two most common and efficient systems for dealing with septic waste and one option I do *not* recommend.

#### **OUT WITH THE OUTHOUSE AND IN WITH THE CODES**

First, don't do what your great-grandparents did. With all the environmental impact laws today, I don't recommend digging a hole

and putting up an outhouse somewhere on your property without researching the applicable laws in your area. If you really want an outhouse, a simple trip to your county inspection/zoning office should get you going in the right direction and let you know if that option is feasible or not in your area.

Hey, I'm not saying there is anything wrong with an outhouse. After all, humans have been using them for hundreds of years on homesteads. However, things are quickly changing when it comes to waste disposal and associated laws, so this may not even be an option for many would-be off-gridders.

Just to make it even more confusing, the option of an outhouse, according to current building codes, can change depending on the type of structure you are building. Let's say you are just going to construct a seasonal cabin. Well, a lot of the codes and zoning requirements pertaining to a vacation home will be different than a permanent residential dwelling. Oh boy, did I just stir up the hornets' nest!

Here is the key (and it's so important you'll hear me repeat it throughout this book!): Always, always check your city/county codes before you do anything. It will save you a ton of time and hassle. Not only that, but building to code has many other benefits. You will likely need to pass a code inspection in order to get your owner occupancy certificate from the county, and to open a home equity line of credit down the line, should you need or want one. If you want these things to happen, you will need to have everything, and I emphasize, *everything* done to the proper building codes for your area.

Cutting corners in the beginning will cost you big time down the road. Not to mention the fact that, depending on where your neighbors are located in relation to your dwelling, some tend not to appreciate people cutting corners when it comes to sewage disposal.

Think about it: How would you like your neighbor up the hill from you to install an unapproved septic system, possibly having their waste wash down onto your property and into your drinking water? I know I wouldn't be too happy about that! Always use common sense in these matters, and think of the impact your

decisions will have on the environment and your neighbors. When living off the grid, that neighbor could save your life someday, or be there to offer a helping hand, so it's better not to create enemies right out of the gate with your pool!

Below I will describe the three most common solutions for your sewage and waste material that will fulfill most city / county code requirements. (Note: Building codes literally vary by state and even by county. Some require a certain distance to be between your well site for drinking water, and your septic, for example. Always check before you build!)

## **STANDARD HOLDING TANK SEPTIC SYSTEM**

A standard holding tank septic system is a good option for off-grid living when city sewers are not an option. The system consists of four components: a pipe that carries waste from the home, a septic tank wherein solid waste contents are stored, a drain field that spreads the waste water out and away from the home, and microbe-containing soil to do final filtering and cleaning of liquid waste. This is the most common type of system for people not hooked up to public utilities. As a matter of fact, this is the type of system my family and I used during my entire childhood.

For this type of system to be accepted and approved by your city / county, a couple things typically need to be in place.

1. An approved engineer must design and draw the system. This proposal must be submitted to the city / county for approval.
2. Test holes must be dug at the proposed septic site, and the results of these tests must be approved by the city / county. The purpose of the holes is to make sure the below-ground geology is appropriate for drainage; usually these holes must go six feet or deeper without hitting solid rock, so the liquid waste has an adequate drainage area.
3. All the proposed building materials for the system must be approved by the city / county prior to final installation.

So, where should you put the septic drain area (also known as the septic field)? Note that some types of topography make it unlikely that your septic system will be approved. For example, if you are high on a steep slope, or near a main river, local building codes may make it impossible to obtain a permit. Codes may also be somewhat arbitrary, such as how many yards must separate your septic field from that of your closest neighbor.

Another factor to keep in mind is that many building codes preclude any structures from being built on *top* of septic fields. This means it's usually imprudent to place your septic field in the exact spot you dream of placing an outbuilding, solar array, or pergola-covered patio. This is yet another factor to check with your city or county *before* you build.

So where is the best location for your septic system? The best place is usually downhill from your home, so the force of gravity moves waste from toilet to tank, and eventually to the drain field. Thus, this type of system is also called a gravity flow system.

If you cannot use gravity and/or cannot find a deep enough area for the drain field, you will have to use a pressure-based septic system.

## **PRESSURE DISTRIBUTION SEPTIC SYSTEM**

A pressure distribution septic system is made up of five major components: a dosing tank that collects liquid discharge; a pump that moves the liquid out of the dosing tank and into the drain field; controls for floats, a timer, and to turn the pump on and off; manifolds to distribute the septic liquid discharge to lateral lines; and lateral lines with holes that evenly distribute the liquid into drain field.

This type of system will have to go through the same city / county approval process as previously outlined for the standard septic tank system.

Compared to a standard gravity-fed septic system, a pressure distribution system is far more complex, but in the end does the same thing. The pressure distribution system does cost much more,

but it solves the problem of dirt that is too shallow for a gravity-fed system to work properly.

I found, on average, a gravity-fed system is in the \$3,500 to \$5,000 range, fully installed by a professional, including engineering drawings and permits. In contrast, I received two quotes for a pressure distribution system in the \$15,000 to \$17,000 range.

For cost and ease of use, you ideally want to use a standard gravity-fed system. The only instance in which you will have to use a pressurized system is if your property does not meet the drain-field depth and/or gravity-feed requirements (something to consider when buying a piece of land in the first place!).

Here is the snag, even if you have a great gravity-fed system site, an unscrupulous installer may try to talk you into the pressurized system, because they can make more money off you . . . a lot more money!

If I hadn't grown up in a rocky, mountainous area similar to my current off-grid Washington property, I would have had no clue that installing a standard gravity system was an option.

Fortunately, I did know, since the first two local septic installers I spoke to tried selling me some song and dance that my property couldn't support a standard gravity-fed system. Again, I was familiar with this type of system and knew better. I finally found a septic installer with some integrity who agreed with me, and the standard system was installed without any problems.

Basically, the two previous idiot installers were trying to "small town" me, thinking that I knew nothing about off-grid septic systems. Needless to say, they are now on Gary's poo list (no pun intended . . . ok maybe a little!) and will not be getting any business or referrals from me. (On that note, I will cover how to deal with bad contractors later on in this book.)

There are many technical variations on these two types of systems—gravity-fed and pressure distribution—but these are certainly the two most common systems you will see. Both of these can be a "do-it-yourself" project, although you should, again, check with your city's/county's requirements first (and be aware that creating a septic field involves a whole lot of digging around in the dirt!).

In my situation, I calculated that once I factored in the time and cost, it was easier to have a professional do it. Plus, this gives me the added insurance that if anything goes wrong, they will fix it. There are certain projects that are out of my comfort zone, and when it comes to poo and pee, I would rather have a professional involved.

## COMPOSTING TOILETS (OR: WHAT NOT TO DO)

I saved my very favorite for the last: the option that I like to call “pooping in a bucket.”

If you are still reading after that comment, please know that I have nothing against making your own composting toilet, which honestly is nothing more than a bucket with a toilet seat, and some saw dust.

You can even buy one these days. Indeed, ever since the simplified, off-the-grid lifestyle has become trendy a whole industry of composting toilets has emerged. As with all trendy companies, most outfits are ready to take the hard-earned money of the inexperienced and naïve. I love when some twenty-something posts a video on YouTube showing off a newly purchased, outrageously priced composting toilet in their ridiculously expensive shack, I mean tiny home on wheels, while talking about how they are saving the planet . . . ugh!

These are usually the people who think oil products are evil, eating animals is cruel, and it’s awesome to just drive around in a Prius (made of petroleum products) while wearing leather shoes (for which an animal had to be killed) . . . but all that is a topic for another time.

For now, I will focus on the professionally made toilets. A homemade option is what I consider a camping toilet, of course, and does not require much skill to build on your own if you wish, so don’t rule that out.

There are two main types of professionally built composting toilets: self-contained and central. A self-contained composting toilet is smaller, and the toilet and composter (the area where solids



are broken down) are combined into one unit. A central type of composting toilet has a separate composter, which requires gravity to get waste to a separate composter. The latter usually is located in a basement or crawl space. They both do the same thing, which is to break down solid biological waste without using water.

The big benefit is they are far more environmentally friendly, but in the big picture they are an expensive pain in the butt. I considered using a composting toilet, but quickly found it would be a complete waste of money for my situation. Here are the reasons why:

- They are incredibly expensive! Costs range from \$2,000 to \$3,000 each for these bacteria buckets. I installed two standard toilets, and had my far more modern and pleasant-smelling gravity-fed septic system professionally installed for less than two of these overpriced contraptions.
- Some have a lot of parts and are hard to install.
- They are massive. I think the term sitting on the throne must have been coined by someone using one of these things.
- They stink. I read review after review about people who bought these things, and the biggest complaint was they smell as you would expect: like poo!
- In order for them to work correctly you have to pee in a separate container that must be manually emptied.
- They only solve one problem, which is the collection and break down of waste. After that, you still have a big container of waste to get rid of, and you will still need to dispose of this waste per city / county code.
- They are not acceptable, in a lot of cases, in terms of meeting city / county code requirements.
- They are highly temperamental. If the temperature is not kept in a consistent range, the bacteria will not compost solids, making them useless in climates with four seasons.

- Some use electricity to aid the composting process, yet living off the grid means using as few electricity-sucking appliances as possible.

For me, I just didn't see the purpose of using a composting toilet, when there were other solutions that took care of both human biological waste and dirty water produced from washing dishes, laundry, and so on. Some people prefer composting toilets because they feel the environmental impact is less, and I consider that to be a subjective argument. I think you can be environmentally friendly, successfully go off grid, and still have some of the creature comforts you are used to . . . starting with a modern septic system.

## Chapter Summary

Don't forget to plan for poop! I do not recommend an outhouse (not always permitted or neighbor-friendly) or a composting toilet (not worth the effort and cost).

Instead, use a modern septic system if possible. This will involve some testing, and I again recommend using a professional to help. Be aware that building codes must be followed when choosing the type and location of your septic system. The most common types are a standard, gravity-based system and the more complex pressure distribution system. The topography of your land will usually dictate the one you must use.

# Chapter 6

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## DEALING WITH GENERAL CONTRACTORS— THE DOS AND DON'TS

### **My Experiences and Brutal Honesty**

Urban legends about dealing with bad contractors are notoriously plentiful, and most do not have a happy ending. In fact, the hiring and management of a general contractor can be so risky and time-consuming that I've devoted this entire chapter to the topic. I hope this advice will spare you the all-too-common headaches associated with builders.

Let's face it: There are numerous websites and even TV shows portraying the horror-story-of-the-day concerning home improvement and new house construction. Many marriages have ended, properties have been foreclosed on, and financial ruin has been caused by dishonest general contractors.

I have been dealing with general contractors for almost 20 years, ever since I bought my very first property: a condo in San

Diego, California. Over the years I have owned: said condo, three houses (all built from scratch), rental houses, investment properties, and even a couple four-plex apartment buildings. So I have had a wide variety of dealings and experiences with construction workers over the years. Now this may sound a little negative, but there is no other way to put it: Dealing with contractors is the most difficult part of the building process for would-be off-gridders . . . period!

Okay, I'm sure I just offended a lot of people who are in the trade, but there are probably a great deal more saying that I'm dead on with my viewpoint.

This world-weary advice comes not only from my experiences, but the stories of others as well. I also have many friends in the business, so I have an outside and an inside perspective to the industry. Yet even with my vast experience dealing with contractors, and with my background in law enforcement, I'm still not immune to being duped by a dishonest builder. Remember, these dishonest contractors are professional conmen, so they will say and do anything to steal your hard-earned money.

Here's the tricky part: There is no perfect system to picking a contractor. They can be very unreliable and can turn on you in a split second. It's truly buyer beware. In fact, if you have to use contractors to help you build your off-the-grid property, it will be the hardest part of the project. But I think by understanding this, you will be more mentally prepared to deal with the issues of construction as they arise.

Now, even if you have the best contractor on the planet, when it comes to building a house, things are going to go wrong. That is just the way it is. The good news is, in almost all cases, these issues and problems can be corrected. And even though most contractors act like your project is the equivalent of designing and building the space shuttle, it is really nothing more than a box structure created mostly of wood, steel, and concrete.

Most of us will need to have at least a couple contractors involved in our project. I have done a lot of home improvement and construction on my own over the years, but there are times when

it is better to use a professional. So, here is my hard-earned advice about doing the best you can in what is often a difficult situation.

## **THE BAD BUILDER'S MINDSET AND WHERE IT COMES FROM: HELLO, JOE SIX-PACK!**

Okay, I'm about to ruffle some feathers, but those who know me know I say it like it is. We are talking about one of the biggest decisions and financial investments you will make in your lifetime, so I think it is important to understand the mindset of the average "bad" general contractor, as seen by Gary.

After having grown up with, worked with, and employed numerous construction so-called professionals, I have developed a good sense of the general profile of the bad ones. This is not meant to be degrading or a condemnation of all general contractors, because there are a lot of good ones. It is just a fact that the construction industry is filled with many, many people who are looking to take advantage of us, John and Jane Q. Public. This is no secret; as I said previously, it is well publicized in numerous media outlets. By giving you a general profile of the average bad general contractor I think it will help you understand the process and what to expect.

I like to call the average general or crappy sub-contractor Joe Six-Pack. This is the guy who occasionally attended high school, and when he did, it was usually to hang out in the back of class and catch up on some sleep. He loved to go to all the parties, but never had any beer . . . that is, until he found yours! He always showed up at festive occasions, but always seemed to forget his wallet when the bill came. He may have actually graduated from high school . . . barely. In all likelihood, though, he never stepped foot on any institution of higher learning or read a book from cover to cover. Combine that with his lack of a work ethic and his knack for getting fired from every low-end job and you have the future bad general contractor in the making.

After getting kicked out of the house and running out of friends' couches to sleep on, there is only one thing left to do . . .

become a laborer in the construction industry (this is the first step to bad general contractor-ville). Let's face it, you really don't need a résumé to become a laborer in construction, and you can get fired repeatedly without it hurting your chances of future employment in the industry. If you have two arms and two legs, you can and will get hired in the construction industry as a laborer. I did a lot of menial labor as a teenager (pretty much zero knowledge in much of anything) and young adult, so not only have I done the work, I worked right next to future or current Joe Six-Pack. As a matter of fact, I have had laborers show up on projects who literally had zero skills and had been working in the industry for years.

Another characteristic of the average bad general contractor or construction laborer is past, current, or ongoing drug and/or alcohol problems. I have no idea why, but the industry seems to be a magnet for people with substance abuse and alcohol issues. On several of my projects, I have found empty booze bottles and drug paraphernalia on the job site. To say I was a very unhappy camper with these incidents would be an understatement.

## **WHAT TO EXPECT FROM JOE SIX-PACK (NOW A SELF-PROCLAIMED CONSTRUCTION EXPERT)**

- He has no work ethic.
- He will tell you anything to get the job.
- He is dishonest . . . and I mean very dishonest.
- He has substance abuse problems.
- He has zero organizational skills.
- He is incapable of following any type of schedule.
- He is always available and never has anyone waiting in line for his crappy services.
- He is the master of cutting corners and doing subpar work.

- He lacks proper tools to do the job and uses yours without your permission.
- He will purposefully do things wrong in order to create more work and charge you for it.

Wow, perhaps you are thinking that Gary is one bitter dude!

Well no, I'm actually pretty easygoing, in general. But trust me on this one, anyone who has had to deal with contractors on a regular basis is laughing their ass off as they read that list, because they know what I say is true. The above may sound like some over-exaggerated exercise in creative writing to most, but I'm actually being nice to Joe Six-Pack. I could write an entire book with numerous "colorful, but true" stories about dealing with awful contractors. It would be therapeutic for me, but you probably wouldn't get much out of it except some painful and cringe-worthy laughs. So let's move on to the proactive advice, shall we?

## So, What to Do?

Now that I have completely destroyed your faith in all humanity (or at least those who hold hammers), I will share some ways to deal with Joe Six-Pack, should you perchance employ such a social skid mark. Moreover, later on I will also give you some tips on finding the right contractor for your project. So this is not all gloom and doom.

But first, here are a few quick glossary terms for those of you who haven't hired a construction team before. On a building site, the general contractor (GC) is the man (or woman) in charge. You hire him and pay him, and he (in theory) hires and pays the people under him and completes the job. The people under him might be employees who regularly work for him, independent contractors who bring their own gear and supplies to complete a specific part of the job, or specialist contractors (sub-contractors) whom he hires

to complete some skilled work on the site. Sub-contractors on a house might include an electrician or roofer, for example, and they often bring their own teams with them.

In theory, the general contractor's insurance and oversight should extend to his employees, ICs, and subs . . . that is, if the GC has got his paperwork in order and does things by the book! You can usually operate as a GC on your own building project, or you can hire a GC and let him take care of the details. Note that the regulations and educational requirements for GCs vary wildly by state and sometimes even by county. I encourage you to check out what the local regulations are for your building site so you are ahead of the curve before hiring anyone posing as a GC.

A final note to drive the point above home: Some states/counties have no requirements for someone becoming a GC, such as minimal years of supervised experienced or passing a written test. All that is required in some areas is paying a licensing fee, and boom, they now hold a General Contractors license. I kid you not. I'm not a big fan of unnecessary licensing and bureaucracies, but holy you-know-what, I think it is pretty important to have some experience and go through some sort of process before you build something that could fall down and kill me!

## **TAMING AND CONTROLLING JOE SIX-PACK**

Now, let's say you didn't manage to find the perfect contractor. If, by chance, you end up with the notorious Joe Six-Pack as your general or sub-contractor, there are ways to still get the work done properly and on budget. Warning: supervising a marginally competent contractor will be a real time-suck and should be avoided if possible. Finding the right contractor is always the best way to go, even if it costs more and takes a little more time.

But, sometimes you get stuck with Joe Six-Pack, and you have to make lemonade from lemons. For example, in the past I have had time-sensitive building projects that needed to get done, and I've had to go with the only contractor available, and that is almost always some version of Joe Six-Pack. However, my advice is to fire



Joe Six-Pack as soon as you possibly can to avoid future pain, as it will definitely come in some form or other.

Here are my tips to managing the Joe Six-Packs of the construction world. This list is not all-inclusive, and not a guarantee of success. However, I have found them useful in some cases when dealing with marginally competent builders. Remember, Joe Six-Pack doesn't follow the rules, and is highly unpredictable, so even the most stringent fail-safes may not work. But here are a few general guidelines:

- Get everything in writing.
- Make sure all bids for work contain “a no higher than” cost cap.
- Get a lien release agreement (a.k.a. lien waiver) for him and all sub-contractors. (This prevents a GC or sub-contractor from applying a lien against your property if he feels you still owe him money.)
- Purchase all materials yourself. (This avoids inflated costs for otherwise inexpensive materials.)
- Set a pre-determined schedule for completed work.
- Pay for work only when completed (Joe Six-Pack hates this one)—again, have the payment schedule in writing before you begin.
- Babysit Joe Six-Pack by never letting him out of your sight while on the job. (Set up a lawn chair and read a book next to him if you have to!)
- Avoid engaging Joe Six-Pack in conversation outside the scope of the project. (This is his way of padding his hours and charging you for chitchat.)

These tips are also great to use with good contractors, too. More than once, I have hired a contractor that started out great, yet he quickly became a bad one as the project progressed. This is part of the bad contractor's scheme: to get you to let your guard

down, and then take advantage of your kindness. Good contractors are good throughout the entire project, as they value you as a future reference. Joe Six-Pack is pure turn-and-burn, and he could care less about referrals.

Here is one last nugget of information: Joe Six-Pack loves out-of-towners, as they will not know anything about his past and (total lack of) work ethic. Moreover, I have found that in small towns, people really don't like to talk negatively about anyone, or about a local company, for what are probably obvious reasons. It is a small community, and everyone knows each other, so they do not want to talk badly about anyone as it can come back on them.

As a matter of fact, I'm dealing with this lack of small-town candor as I write this section with the most recent contractor I had to terminate. I thought I had done the best I could to locate a good contractor by getting a referral list from the county building inspector's office. I looked into his background, not real deep, but didn't find anything negative, and I couldn't find anyone with anything negative to say about him. Of course, once the red flags started to appear about halfway through my project, people gave their honest opinion, because at this point I had found out the truth by my own experience.

Of course these warnings are not exclusive to contractors. There are bad apples in every profession. But unlike many everyday choices, the building of a house is one of the biggest life decisions you will ever make, so it tends to have a much larger impact if things do go badly.

## How to Find a Good Contractor

Now that I have completely scared you away from ever using a contractor or building a house off the grid, there is some good news!

There are plenty of good contractors out there, it just takes a

little more time and energy to find them. A good contractor will make your building experience go as smoothly as possible. As I said above, though, things always go wrong in some way with construction. That is just the way it goes. Unhelpful weather, supplier issues, unforeseen problems with the building site, and other surprises can and do happen. But a good contractor will work with you, fix it, and make it right. A bad one will blame you for it, and charge you an exorbitant price to fix it.

The best and most reliable way to find a good contractor is by referral. Of course there are numerous websites like Angieslist.com, which can be helpful, but those don't really work in more rural areas—people just don't use them as much.

It can be even more difficult to find a competent contractor for an off-the-grid home, as this is a highly specialized project. To be honest, finding contractors for my off-the-grid project has been more difficult than I expected because most contractors are only familiar with traditional construction. This is why doing due diligence is so important.

Now, as I explained previously, most people in small towns will not say anything negative about a local contractor or company, especially if they do not know you well. So the way around this is to find the local people who have recently had houses built or renovation work done. These are the folks you want to ask for referrals. If they had a negative experience, they will usually not give you the name of the builder. If they had a good experience, they will gladly give you the name of the company or contractor.

If you can't find anyone in town who has had construction work done recently, you can try asking for referrals at the local building supply stores. Call a few and see if any one name gets mentioned several times—this is a good sign. Now, this is not as good a way to get referrals as the previous method, since building supply stores know who is busiest, but not necessarily who is best. But it's better than nothing, if that's all you have.

So now that you have some names, the next step is to get a few bids.

## GETTING ESTIMATES/BIDS

Good contractors will gladly give you an estimate/bid for your project. It's part of doing business, and the good ones will have an organized and detailed estimate/bid process in place.

A big red flag for a bad contractor is giving you your estimate/bid handwritten on a piece of paper and/or charging for their time to do an estimate/bid. Another red flag is a lack of detail on materials and costs for each phase of the project.

We are all human, and get excited to start a new project. With our newfound excitement, we sometimes do things that we wouldn't usually do—like not get enough bids. Aim to get at least three quotes from three different contractors before making a final decision. I have taken short cuts on getting three estimates/bids on projects in the past, and it has bit me in the butt every time. This is very important: Never ever share the bid details of one contractor with another prior to them bidding the project. I have made this mistake more than once, and have gotten back a bid slightly lower or almost exactly the same as the contractor's bid information I shared.

Estimates/bids do three things:

1. They give you an idea of what your project is going to cost.
2. They keep contractors honest, as you have something to compare your project to, which allows you to ask questions on prices and material differences should costs increase.
3. It slows down the process, so you don't jump into your project too quickly without all the information—you don't know what you don't know, at least not yet.

Besides a professional and detailed quote, here are some more traits to look for when searching for a good contractor.

## TRAITS OF A GOOD CONTRACTOR

- Provides everything in writing.

- Will not take a deposit or start work until everything is agreed to in a signed contract.
- Contract reads like a proper legal document and allows for contingencies (clauses that detail how unusual circumstances will be handled, such as if you want to exit the contract, or if the contractor needs to make a substantive change to the original plans).
- Highly organized and professional.
- New business is primarily by referral.
- Does a great deal of local work.
- Will provide references for past work (e.g., phone numbers for previous customers) without being asked.
- Is prompt and on time.
- Is well known (in a good way) in the local community.
- Returns your phone calls promptly. Has voice mail.
- Isn't necessarily able to start tomorrow, as he probably has several weeks or months of projects already lined up due to his good reputation.
- Is currently licensed with the state or county licensing board (requirements vary by state and county). Displays official license number on business card, work truck, or provides upon request.
- Carries both general liability and worker's compensation insurance (requirements may vary by state).
- Is bondable or (better yet) bonded (protects consumer if contractor fails to complete the job).
- Is happy to show you his certificates of insurance. The policies are current.
- Has a portfolio of previous work you can look at (this may be a book of photos, or these days, a full Facebook scroll of ongoing projects).

In very rural areas, it may be impossible to find a GC that ticks all these boxes. The idea is to hire someone with as many of these qualities as you can.

A note about licensing: GC licensing requirements vary greatly from state to state. Some states have rigorous, notoriously difficult exams and require character references to acquire a GC license. Others only have licensing at the local level, while still others have no requirements for GC licensing at all. I strongly recommend you spend some time online to get a sense of what it really means in your area if someone says they are a “licensed” contractor.

## Difficulties of Finding a Contractor for an Off-Grid Project

Building an off-grid home is, in many ways, its own animal. There really is no template. For each of us, it will be a unique experience, because each of us has different wants and desires. It will probably be a unique experience for your builder, too, since the vast majority of small-home and off-grid construction is done by contractors who only have experience with traditional building. This is true despite the fact that smaller scale and more remote homes are becoming more popular.

The simple fact is that you will have to be much more involved in an off-grid construction project than you would in the building of a regular home. There are some small companies throughout the country that specialize in green/off-grid construction, but their services usually come at a lofty premium. For most of us, this just isn't an option.

The bottom line is that you will have to find a general contractor who is flexible and open to trying something new. However, it's more than likely that you will not know if this is the right contractor for the project until you are well into it. As of this writing, I'm only using a jack-of-all-trades helper and I'm now the GC for my

off-grid project. One lesson I have learned is to be slow to hire and quick to fire: If things don't seem to be going in the right direction, move fast and let the contractor go.

From my experience, and from what I have learned through others who have gone down this road, building off-the-grid is challenging and many mistakes will be made. It's just the way it is.

## Building Permits—Why You Need Them

This section is not intended to cover all the building requirements you will have to follow for your project. They change from state to state, county to county, and city to city.

Building codes are rules that specify the minimum standards for constructed objects such as buildings. Codes are typically developed nationally, optionally adopted by states, and enforced locally. When something is built “to code” it means the structure meets the set of codes that your local authority (e.g. municipality, city, or county) has opted to enforce. Codes are intended to protect consumers. A good contractor will know and understand all local codes so that your structure will pass inspection by the local building inspector.

Now, building codes are constantly changing, so they are continuous moving targets. As a matter of fact, I have found that today's building codes are so confusing, most inspectors don't understand or know them all. That can be good and bad, depending on the situation, but one thing I can guarantee is that it's best to follow the codes. If you try and “work” the system and somehow get around the local code and inspection requirements, your efforts will most likely come back to haunt you.

Here's an example of what I mean. In some cases, people simply buy a piece of land, throw up a structure, and live freely, unencumbered by any building codes or environmental regulations. Although this freestyle building approach may sound tempting, I don't recommend it. It looks good on TV, but in reality it creates

a lot more stress than it is worth. Who wants to be looking over their shoulder all the time, wondering if the county is going to hit you with fines, or a whole host of other penalties for not following the rules.

## **WHY FOLLOWING THE RULES IS ALWAYS THE BEST CHOICE**

Yes, the rules suck, but I have found the county inspector's offices in rural communities to be very easy to work with.

So what does this mean? It means before you start building you will need to submit your building plans to the county in order to have them approved. This is not free, and the price varies depending on where you are located. For me, the entire process was around \$1,300 for permits, not including the engineering fees for my building plans.

There are advantages to doing things right by getting the proper permits.

- You will have less undue stress.
- Properly permitted properties are worth far more than unpermitted properties.
- Regular inspections can save you money by catching errors in the construction process, since the building inspector acts as an impartial third-party who is (in theory) an expert at catching mistakes made by contractors that may be costly and unsafe.
- Bad contractors can be weeded out by having their work double-checked, again saving you time and money.

Even though you are going off the grid, you still have to look at your property as an investment. By cutting corners and not following the proper building processes, you only hurt yourself. What happens if something unexpected occurs, and you need to sell your property quickly? If it is an unpermitted property that is not built to code, the chances of you selling it quickly are almost zero. The



worst thing is that you have greatly reduced the value of your property.

When I was initially considering different land packages for purchase, I looked at numerous properties with unpermitted do-it-yourself houses, and almost all were complete wrecks. The amount of time and money it would take to bring these houses up to code was nowhere close to being worth it. As a matter of fact, I wouldn't even look at properties like this after a while. To me, they represented real scams, since most of the sellers were up-charging for the equivalent of a crappy shack in the hopes of finding a buyer who didn't know anything about sound construction principles and codes.

The bottom line is that, before buying any rural property with a home, outbuilding, or garage, make sure they are properly permitted. This applies to structures related to alternative energy sources, such as a solar panel array, about which we will discuss more later.

A good real estate agent will be able to find out whether or not a structure is properly permitted. Hopefully they will know even before you look at the property, saving you time. If your Realtor can't tell you, just go to the county assessor's office, and they will be able to tell you, or at least send you in the right direction.

If the dwellings on a piece of land are not permitted, they are nothing more than worthless structures as far as I'm concerned, and at that point, you are only negotiating for the value of the land itself.

I will leave you with one last piece of wisdom: Technology is at a point where you will eventually get caught for building an unpermitted or unapproved structure. That thing called Google Earth is pretty sophisticated these days. As an example, I was able to go to the county technology office and get full color overhead shots of my property to help me figure out my property lines. If this is possible in the sparsely populated, rural area I'm in, I'm pretty sure it is available almost anywhere.

I have heard of people sneaking structures on their property only to get caught and smacked with a nice back-tax bill . . . don't be that person!

As you can see, dealing with contractors and getting your property built can be very time consuming and stressful if not done properly. The main piece of advice I want to leave you with is to take your time. I have spoken with several people who are doing or have done what I'm attempting with my off-the-grid property, and all have taken years to complete their projects. To date, I have yet to meet or talk to a person who has completed such a project in one season/year. I would say, on average, it takes anywhere from 3-5 years to complete an off-grid project such as mine. This isn't to say that you cannot get it done quickly if you have everything organized and a wad of cash, but in most instances, this will not be the case.

## Chapter Summary

It's a sad truth that it is very hard to find honest, competent contractors out there. Many people in the construction field have dubious skills, are looking to make a fast buck, or have a drug or alcohol problem. This chapter contains some valuable tips on how to separate the best from among the rest.

Make time in your schedule to supervise the contractor you hire yourself, and always get everything in writing. Be slow to hire and quick to fire. Be aware that off-grid construction is a relatively new field, even for good, experienced contractors.

It's critical that you fully plan your home before building and follow all building codes for each component of your structure. Building codes vary by county and by state and frequently change. Take the time to research local codes. If you are buying a property with existing structures, check that they are code-compliant. Don't try to cheat the system—it's almost never worth it.

# Chapter 7

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## THE TINY HOUSE MOVEMENT—A GOOD ALTERNATIVE OR JUST ANOTHER FAD?

As I write this, the tiny home movement is in full swing. There are numerous TV shows, magazines, and websites dedicated to living the tiny home lifestyle.

So what is a tiny home? It's a house that is constructed on a rolling chassis (like a travel trailer) or a permanent home that is 500 square feet or less in size. These smaller travel-trailer-type tiny homes are really popular with the Millennial crowd at the moment, but to be honest I'm not a big fan of these for several reasons, which I will outline in this chapter.

### **Tiny House Construction**

The base upon which mobile tiny homes are constructed—the aforementioned moveable chassis—is basically a steel frame with

wheels, pretty much like a utility trailer that you would tow behind your vehicle. People either purchase plans that show them how to build the structure on this rolling chassis and do it themselves or pay a company to build the house to their specifications.

Tiny homes are primarily built with standard wood framing/stick construction (like a typical wooden framed-in house you might see built on a plot of land), although with mobile tiny homes the house is built on top of the moveable chassis. These types of tiny homes are usually under 8.5 feet wide and vary in length from 12 to 24 feet, and are restricted to 13.5 feet in height in order to fit under highway underpasses when being moved.

## Why You Shouldn't Jump on This Trend

The primary reasons these tiny homes are popular are that they are mobile like a travel trailer but cheaper than a standard home. Just like anything trendy, there is usually a lot of smoke and not much real substance behind the claims. In my view, mobile tiny homes are usually a horrible solution for off-gridders and simplified living enthusiasts. Here is why.

- They are trendy, and anything trendy is usually a scam.
- They are actually incredibly expensive, with prices that frequently range from \$450 to \$650 per square foot. In comparison, an average custom-built house is in the \$100 to \$200 per square foot range, typically with the land included (although this does vary from area to area, of course).
- They have to be inspected and registered by your local motor vehicle division, meaning you must pay ongoing, yearly registration costs.
- A tiny home will typically have higher insurance premiums than an RV.

- They are very heavy, usually over 10,000 pounds. In comparison, my traditional travel trailer weighs a little over 5,000 pounds.
- They can be dangerous to move because they tend to be very top-heavy.
- They usually lack plumbing; if you want standard RV-style plumbing, it usually comes with an upcharge.
- They are usually made primarily of wood, and are thus a fire hazard when compared to RVs.

I'm honestly puzzled by the mobile tiny home movement, as RVs have been around for decades, and today, are incredibly comfortable at a fraction of the cost of a tiny home. I went to one of the more popular mobile tiny home manufacturer websites and priced out one that was around the same size as my current travel trailer. It came out to \$70,550! I purchased my travel trailer brand new for \$25,500. Don't get me wrong, the tiny home trailer was made from nicer materials, but it had no more functionality than my travel trailer.

I can't wait until all these people who purchased these mobile tiny homes decide they are done with the trend and try to sell them. I'm fairly certain they are going to lose a ton of money, and that is if anyone is even willing to purchase one of these overpriced sheds on wheels.

A good alternative to the mobile tiny home is a regular house that is constructed just like a normal permanent residence, only smaller. I have lived in a "tiny home" by this definition—I called it a cottage—and I really enjoyed the simplified living. I originally thought about going this route when building my off-grid house, but I decided to go bigger. The main reason is that my off-grid home is still an investment. If I built a very small house, should I ever decide to (or had to) sell the property, the pool of prospective buyers would be drastically narrowed. I, like many off-gridders, plan to live in my off-grid property long term. However, unplanned events can happen in life, and I would rather build a house that is easier to sell if at all possible.

Tiny homes have also have become trendy. With anything trendy, you should be prepared for those aforementioned bad contractors that prey upon the naïve. I have heard unscrupulous contractors repeat a specific, unfortunate phrase time and again: “Smaller means more expensive.”

No, it doesn’t, actually.

First, the exceptions: In some parts of the construction process, yes, smaller does mean more expensive, because there is a fixed cost to the “starter” elements needed for a construction job. For example, the price of bringing heavy machinery to a remote site or the cost of permits will be the same whether the job is small or massive. This type of fee will obviously increase the average cost per square foot for your house relative to a larger project.

Now, in the big picture these costs should not add a drastic amount to your total fee, but guess what good old Joe Six-Pack (the incompetent contractor) does? He charges up (adds unjustifiable fees) to a smaller project . . . not because it costs more, but because Joe Six-Pack wants to make a killing for doing less work. I have been quoted these kinds of inflated prices by contractors, and witnessed different contractors doubling or tripling the cost for small projects for other people.

I’ll be honest, it’s difficult to even find a contractor willing to do a small project unless they can charge inflated prices, because in their mind it just isn’t worth it. I have no idea why they think like this, but from my experience this is just the way it is. Sure, when buying certain building supplies in a larger quantity, you can get a discount, but it should not be two to three times more per square foot for a smaller house than it would be on a larger project.

So what’s the solution? To make sure that your tiny home will be built at a fair cost, consider purchasing the materials yourself, and then have your contractor bid on labor only, with a “not to exceed more than” clause in the job contract. Any contractor worth their salt will have no problem doing this, as it makes their life a lot easier not having to get building materials. All they have to do is show up and build, and you are the gofer that will get whatever they need.

Building supplies are available at local building-supply shops and box stores such as Lowes or the Home Depot (for which contractors make up a large section of clientele). If you don't have a truck, remember to ask if they will deliver the supplies directly to your site and what additional fees this might add. Consider how you will store the supplies at your site (preferably in a secure, weather-proof location such as a shed or lockable trailer). Remember to carefully track the monies you spend on building supplies (called a bill of materials in contractor-speak), as these figures (plus the cost of labor) will go toward the cost basis of your home, which may impact the capital gains taxes you owe when you eventually sell, depending on your circumstances.

Finally, make sure you can return excess supplies or items you purchase back to the store. Not every screw, bolt, or fastener works well with every kind of weather condition or building material. If your contractor is good, he will tell you if you accidentally bought the wrong nails or what-have-you before blindly installing them.

This is not to say there are not some good contractors out there who will charge fairly for a tiny home project, but it usually takes more time and effort to find them. The ones I have found are usually into the off-the-grid or simple-living lifestyle themselves. With that said, it is definitely a *much* smaller group, but they are becoming more common these days.

Of course, if you are planning to build your tiny home on your own, that is a different story, as it will cost you far less. The odds of you recovering your initial investment will be far higher this way, even if you have greatly narrowed the potential home-buying demographic for your structure by building a tiny home rather than a small-sized, regular house. I know people who have built a standard stick-built tiny home for around \$35 to \$50 a square foot.

You can do it even more cheaply if you do all of the work yourself, and mostly use materials from your own land. I will warn you, this is not as easy as it sounds, otherwise everyone would be building their own homes. If you have ever tried to mill your own lumber from a log, or splice your own hand-split wooden shingles in your backyard, you will know this to be true. However, building

a tiny home from the resources on your own land is not impossible, and could be an option if you are both handy and have a lot of time to devote to the project.

## Chapter Summary

A tiny house is a very small, moveable home built on a chassis. However, I don't recommend you follow this trend, since tiny homes are often overpriced and difficult to resell. To lower tiny house costs, you can buy supplies and/or perform the labor yourself. However, given a choice, avoid tiny homes altogether, and go for a cottage or modestly sized, regular home on a foundation instead.



# Chapter 8

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## OFF-GRID POWER: UNDERSTANDING SOLAR, WIND, HYDRO, AND GEOTHERMAL ENERGY OPTIONS

### **A Brief History**

Humans have been using sun, wind, and water as sources of free, clean power for thousands of years. Think of sailboats, sundials, and dams as long-used examples of how these Earth-given resources have been—and in many cases still are—used. Throughout mankind’s history and still today, there are entrepreneurs, politicians and others who have figured out how to sell and regulate something that is actually free.

Here’s a perfect example of just how powerful the sun is. Every day, it produces 35,000 times the amount of the total energy required by all who currently use electricity! Plus, it is 100% green and free.

There is no better way to become self-sufficient, than to take

advantage of these ancient and unlimited power sources. Sure, they may not be as efficient as our modern power grid, but they are a great way to take one more step away from the unwanted control imposed upon us by government regulations and the increasingly influential grip of privatized utility companies. There is no better feeling than knowing you are in control of your own power, especially in how and when you want to use it.

## An Introduction to Alternative Power Systems

When it comes to living off the grid, there are many challenges. Probably the most critical, after access to water, is the question of how to manufacture your own power (electricity) for your off-the-grid property.

By definition, “off the grid” means not being tied to any type of public utility. Of course, you could still use an alternative power source while tied to the grid, but that is not complete off-grid living. That being said, you can still use one or more alternative power sources even if you do not plan to live 100% off the grid. Your solution will just be a little bit different in terms of use, and possibly require different equipment.

Conversely, there are reasons to stay connected to the grid. For example, you may have essential medical equipment that relies on a completely consistent energy source, or the financial incentive programs for green energy in your area may make it vastly cheaper to go grid-tied for the next few years. It all depends on your goals, your land, and your budget.

Prior to my off-grid adventure, all my previous homes were tied to the grid, and I had never used an alternative or green power source. Needless to say, I had to start from scratch and figure out what the best avenue of alternative power was for my needs. Not

to mention, I had a difficult time finding other people of whom to ask questions who were using alternative power sources.

My hope is that this section will answer a lot of questions for those of you thinking about living off the grid, and will improve your understanding of what may be the best solution for your needs. I will say this: The most effective and reliable system is one that incorporates all three of the primary alternative power systems, since they tend to be complementary to each other in varying weather conditions (more on this later). The problem in most cases is that this will not be a practical solution for most people (for example, if you don't have access to a stream for a hydro power solution). Usually, two of the three systems can be utilized by most off-gridders, but it depends on your specific property type, and location. (Again, this goes back to the importance of forming your goals and doing research before buying land!)

Please note this section is not intended to be highly technical, or provide you with template systems, but rather to inform you about the most common alternative power sources and how they work. There are numerous books that you can purchase with detailed information about setting up systems from A to Z. I will provide you with a list of resources at the end of the book for those who need assistance setting up their first system. I'm no expert in this area, and detailed explanations are better left to the professionals who do this on a daily basis.

One other note about professionals: If you want to build an alternative energy system, it may pay to check with a green-energy-aware accountant first. That's because alternative energy systems offer a rare opportunity for a tax credit, which is a dollar-for-dollar reduction in the amount of income tax you owe. (And much better than tax a deduction!)

Research the Residential Renewable Energy Tax Credit before you build, as you could potentially save thousands of dollars on your green-energy-system costs. Also check out [www.dsireusa.org](http://www.dsireusa.org) for a nationwide listing of many other green-energy financial incentives, which vary by state, county, and local utility providers.

Here are some alternative energy systems that work well with off-grid living.

## Solar Power 101

So what is solar power? Solar power is when the sun's light or heat is converted into a usable energy source.

Solar power is becoming increasingly popular and more affordable. Just like the technology behind computers, solar technology keeps improving, making it easier and more affordable to live an off-the-grid lifestyle, with many of the amenities we have become used to in the modern world.

The two most common uses of solar energy are the generation of heat and electricity. The use of solar for generating heat is usually in the form of "solar hot water": those black pipes you see on house rooftops that help heat pool water.

The more common type of solar energy used today is the harnessing of the sun's rays into usable electricity, typically via a solar photovoltaic (PV) system. These are the large black-glass panels you see on rooftops or mounted on special frames on the ground.

Before we dive into a few technical points, let me just say that what I will focus on here is true off-grid solar—that is, a stand-alone system that consists of the panel array, batteries, and a back-up generator that exists solely to provide power for you in your private home.

Here's the important distinction: With off-grid solar, the energy your panels generate goes into your home. With on-grid solar, you are essentially selling the power your panels generate back to a utility company, and not using it in your own home.

Now, a whole bunch of "in-between" on/off-grid hybrid models and utility "buy-back" programs exist. It's not my intention to explain the technical nuances of each in this book. Rather, for now it's crucial to understand that solar (and particularly on-grid solar) is strongly regulated to ensure the safety and consistency

of on-grid energy, from state-to-state, county-to-county, and even regionally, depending on which power company serves your area. So the rules about a residential solar array that apply to someone who lives five miles from you may not apply at your location. Even off-grid solar is regulated and subject to local building codes. I highly recommend you research your state, county, and utility provider's policies regarding solar before building, particularly if you plan to have an on-grid component to your system.

Now, for many, the first off-grid solar question will be: Do we get enough sun at our home to take advantage of solar power? Here is a great tool to estimate the amount of usable sunlight per day in your area:

[http://www.nrel.gov/gis/images/map\\_pv\\_national\\_hi-res\\_200.jpg](http://www.nrel.gov/gis/images/map_pv_national_hi-res_200.jpg)

Here is my simple way to figure out roughly how much available sun power you will be able to generate per day using a solar panel system.

(Solar panels combined maximum watt output)  $\times$  (average hours of sunlight per day)  $\times$  (0.5) = daily sun power generated

*Note: In this equation, 0.5 is used as an estimate of power loss due to system inefficiencies and conversion factors.*

Example:

My system at this time consists of six 300-watt solar panels, which gives me a possible maximum watt output per/hour of 1,800 watts. To convert watts to kilowatts, divide watts by 1,000:

1,800 watts = 1.8 kilowatts (kW).

According to the map at the link above, the average sunlight per day in my region is 4.5 hours.

So my equation will look like this:

1,800 (watts)  $\times$  4.5  $\times$  0.5 = 4,050 watts of average power produced per day (or roughly 4 kilowatts per day)

This is more than enough power for my daily power use. How can you know what your daily power usage will be? The only way to determine this in an off-grid situation is to list every power-using item you have (or intend to have) and add them up. Now, this method is not very accurate, but that is all that you can do for an off-grid situation. (It is possible to design a solar array with the capacity to add extra panels at a later date; the easiest way to ensure your system has this capacity is to work with a solar professional or an electrician who specializes in green-energy work.)

If you are converting an on-grid home to off-grid power, it is much easier; just look at your average monthly consumption over the last twelve months (bearing in mind you will probably use more power at certain times of the year).

## MY SYSTEM AND RECOMMENDATIONS

When I planned my off-grid home, I was no solar technology expert by any stretch. I had to learn about this topic on my own. What I soon found was that trying to learn every aspect of developing your own solar power system is probably a futile task and better left to professionals. I'm not saying you can't do it yourself, but for me, it was better to learn the basics and then work with someone who could recommend a system. With a system chosen, I could find a certified electrician to help do the installation.

I'm a subscriber and big fan of *Backwoods Home Magazine*. They are a great resource for people who are looking to homestead or live off the grid. It was in an issue of this helpful periodical that I found an advertisement for a company called Backwoods Solar (no connection to the magazine). I called them up, told them what I was doing, and they recommended a system for my needs.

Backwoods Solar has been in the alternative energy business for over 20 years, and they have it down pat. They will send you a great book for free that explains all the things you need to know and how to get started.

They do not install the systems, but they put the required components together for you, so you have all the parts you need. They also have a couple of contractors they recommend for installation. If you want to do it yourself, they will literally walk you through how to get it done, step-by-step. For me, the solar array was just going to take way too much time to put together and install myself, so I did kind of a hybrid install. I ended up doing part of it myself, and then using a certified/licensed electrician who had done other solar/alternative energy installs.

Here's why: When it comes to home building, I know there are certain things I can do well or can quickly learn. However, for me the potential risk and liabilities of hooking up a power-generating electrical system to my own home was just not worth it. If I screwed something up installing the solar system myself, it could cost me thousands of dollars, either to pay someone to redo it properly or in damaged equipment.

For those without much building experience, it can also be very unsafe. (It's live electricity, folks!) I'm all for learning new things, but I'm also a pragmatist. I know there are professionals in various fields for a reason. I would rather pay the money to have skilled help, and have some piece of mind, not to mention lower stress levels.

Nevertheless, for my own solar array, I did all the non-electrical grunt work myself. This approach saves cash, and lets you be as independent as possible in setting up an off-grid home. For my project, I purchased and organized all the equipment at the building site, readying it for installation. I also mounted all the solar panels (i.e. attached them to their metal racking base), and roughed in all the mounting for the other components (such as the inverter—a big metal box of electrical components that needs to be installed, too).

I left all the hookup and electrical work for the electrician. By doing this, I not only saved thousands of dollars, but also had the reassurance it would be installed correctly—and if not, the electrician would be responsible fixing any issues that came up.

## BASIC SOLAR SYSTEM COMPONENTS

A solar electric system is made up of more than just a bunch of black panels. Here are the other components you will need to purchase to make a complete system (as taken from the Backwoods Solar website).

**SOLAR MODULES** [panels] are installed in groups of 1 to 18+ modules on a solar mount, which in turn attaches to a building, to the roof of an RV, or atop a metal post or racks in the yard. Together this is called a solar array. Each solar module is wired to the other modules in that array by sunlight-tolerant solar interconnect wiring. Several arrays may be wired to a solar combiner box, where they are all connected to heavier underground wires taking the power to the battery and equipment room.

**A CHARGE CONTROLLER** is a small wall-mounted component, which receives power from solar, wind, or micro-hydro generators, and controls the flow of power to the batteries. To prevent battery damage due to overcharging, the charge control automatically cuts back, stops, or diverts the charge when batteries become full. A charge control may have manual control switches and may have meters or lights to show the status of the charging process.

**BATTERIES** receive and store DC electrical energy, and can instantly supply large surges of stored electricity as needed to start or run heavy power appliances that the solar panels or hydroelectric generator alone could not power. This large power capability can be a fire hazard just like utility company power, so fuses and circuit breakers on every circuit connected to a battery are essential. Battery size is chosen for both surge power requirements and for the amount of reserve power needed. Typically, 2 to 12 square feet of batteries weighing 150 to 5000 pounds are enclosed in a battery box with a vent pipe to the outside.

**AN INVERTER** is the major electronic component of a power system. It converts DC power stored in batteries to 120-volt AC: standard household power. Short, heavy cables with a large fuse or circuit breaker carry battery power to the inverter. After conversion to AC, power from the inverter usually connects into the circuit breaker box of the house in place of utility lines. The house breaker box routes power to lights, appliances, and outlets of the house. The inverters Backwoods Solar offers for home power come in ratings from 300 to 8000 watts.



A system like mine that uses components as described above costs about \$10,000 to \$15,000, depending on the type and number of storage batteries.

## SOLAR POWER LIMITATIONS

Obviously, the biggest limitation you will face with solar power will be how much sunlight you have in the area you plan to live. If you live in a place such as Arizona or Southern California, there is a good chance you can get by just fine solely using solar power (with the right battery storage capacity).

But those of us in less-sunny areas will need to have more than one alternative power system, combined with good battery storage. This is because, when there is no sunlight (such as at night), you will need to have the ability to utilize stored power from your solar or from the other components of your alternative power system. The same goes for less sunny days of the year.

A good battery bank is also important because the sun's light is not static, meaning you will not have full solar power utilization all the time. Instead, it will vary per the position of the sun throughout the day. (A note about batteries: these are currently the most finicky parts of an off-grid solar array, in terms of ongoing maintenance and replacement costs. I recommend carefully researching the pros and cons of different battery choices before making an off-grid solar decision.)

Because the sun moves across the sky throughout the day, there are solar panel mounting systems that can either be rotated manually or have small motors installed that rotate the panels gradually to obtain maximum sunlight. I did look into this option, but for me, the cost and effort did not make sense. Solar panels are so cheap today, it is more cost effective to add panels than to design an elaborate solar panel rotation system.

A more effective solution is to install a complementary energy system to offset the limitations of sun power. For example, on a stormy, wet day, you won't get much sunlight and therefore not much solar electricity . . . but you may well have good wind or rain (hydro) options due to the turbulence and/or downpour!

# Wind Power 101

Generating “wind power” simply means using a wind turbine (propeller) to catch the wind and turn a turbine connected, via a shaft, to an alternator or generator in order to produce electric power. Essentially, the system converts mechanical energy (the movement of the wind) into electrical energy.

For wind power, I suggest using a small wind turbine (6-foot diameter or smaller turbine) to supplement your off-grid alternative power system. Larger turbines can put out a great deal of power today, but the cost and size are not within reach of the average off-gridder.

With that said, smaller wind turbines have become incredibly affordable: many come in under \$1,000 (not including installation). Once you jump past the 6-foot-turbine size, the price moves up very quickly. As an example, you can get a wind turbine in the 6-foot diameter range for \$1,000 or less; a turbine with a 15-foot rotor can start to get in the \$10,000 range.

On average, a small wind turbine needs about 6 to 7 miles per hour of wind in order to produce a usable amount of energy. Depending on the speed and consistency of the wind in your area, a small wind turbine can produce enough power daily to run a small energy-efficient electric refrigerator.

The good news is most regions of the United States have sufficient wintertime winds to support most off-grid power needs. To find out how it’s usually blowing in your area, use this winter wind guide:

<http://www.primuswindpower.com/solarwind-solution/>

## BASIC WIND POWER SYSTEM COMPONENTS

The great thing about adding wind power to supplement your solar power system is that the components are almost the same. You simply tie your wind turbine into your solar power and battery storage system. The new wind turbines have smart technology, so they are already made to be tied into an existing solar panel system.

## MY SYSTEM AND RECOMMENDATIONS

As of this writing, my plan is to use a hybrid system of solar panels and wind power. The primary source of my off-grid property's electricity is my solar system. This kind of hybrid system is the one I recommend, as it utilizes nature's two most accessible and reliable power generating sources. My wind system will tie directly into my solar power conversion setup and consist of one Primus 46"-wind turbine. I'm contemplating putting in a second Primus 46"-wind turbine depending on my future power needs.

This will bump me up to about five kilowatts of alternative energy production per day. This may not seem like a lot of electricity production per day to most, especially when you consider that, according to the U.S. Energy Information Administration, the average American household uses about 30 kilowatts of power per day.

Well, we off-gridders are not the average Americans; so in this case, the "average" number doesn't apply to most of us. Also, remember that my household at this time consists of one, so I'm able to use a smaller system than some. But I feel, with some conscious changes to energy consumption habits, most off-grid households could make my system work.

In addition, off-grid homes will typically use a number of energy efficient appliances, and some of the everyday energy-hogs (such as air conditioners) will be eliminated or run on propane (more on this later).

## WIND TURBINE LIMITATIONS

One of the main problems with larger wind turbines, in addition to costs, is they make a lot of noise and take up a lot of space. Just think of a 15-foot rotor somewhere on your property; it needs to be mounted up fairly high and is almost two stories tall! I don't know about you, but that is not very practical. Not to mention, at that size, their installation is not really a do-it-yourself project.

Wind also presents a consistency problem. It's just not always windy outside! In contrast, the sun always shows up and emits

energy, even when covered by clouds, smoke, or haze; it's just sometimes at a reduced rate.

In contrast, the wind is far less consistent, and there is no way to predict what amount of energy it will be able to produce from day to day. Moreover, the power output of a wind system can be affected by the topography surrounding your intended site, as well as the height of objects (such as trees) surrounding it. So for some homes, using the power of water will make more sense.

## Hydro Power 101

For people contemplating living off the grid, or who want to supplement their current utility-tied electrical system, a micro-hydro setup is a great way to go, provided that you have a stream running through your property. The downside: regulations are changing all the time, so you will have to make sure it is permissible in your city and county to use a micro-hydro system. Two things I can pretty much guarantee: it will require a permit, and it will have to be inspected and approved.

There are two characteristics that determine how much power or energy can be obtained via hydropower: “flow” and “head.” Flow is the amount of water that flows past a given point in a given time period. Head is the water pressure, or how hard the water wants to flow. Higher pressure, water volume, or both will increase your system's ability to produce power. A micro-hydro system essentially consists of a length of pipe that captures flowing water in a downhill stream and then uses it to turn a turbine, thereby generating electricity.

Per Backwoods Solar, you will need to answer four questions to determine which micro-hydro system is right for you:

- What is the elevation change (from intake to the turbine) over the length of the pipe?

- How many gallons per minute of flow are there (minimum and maximum)?
- What is the size, type, and length of pipe (if it is already installed)?
- What is the wire distance from hydro plant (lower end of creek) to the home or power-shed?

Just as with a wind turbine system, a hydro system can work off the same basic components as a solar array. Now, you don't need to have a solar system to use a hydro or wind turbine system. Just note that the battery storage and DC to AC conversion work off the same components and principles for each system.

That being said, if you do have consistent water flowing through your property, micro-hydro is a great way to go. For that matter many people use seasonally flowing creeks to supplement their off grid system—your choice will depend on your resources and needs. Of the three main alternative energy-producing sources, hydro is considered the most reliable and cheapest because water usually runs 24/7, 365 days a year. Therefore, a hydro system is a continuous and cheap power source. This is why hydro is my number one recommendation for off-grid power.

When I was first looking at properties, I considered some properties with small streams running through them. I did this for two reasons: easy access to water, and for generating power. In the end, I decided to purchase a property without a stream. Instead, I went for one with a great view.

This decision was made for several reasons: the prevalence of bugs that live nearby water in my area; the fact that streams can dry up at different times of the year; and the inconvenient truth that your power generating stream could be diverted away from your land by a property owner who lives higher upstream. I did initially try going for the off-grid “trifecta:” isolated land, with great views, and a hydro-worthy stream. However, this “perfect” situation was incredibly difficult to find, not to mention an expensive proposition where it did exist.

In the end, topography, shade, water access, the height of surrounding structures, your budget, local permitting and regulations, and your personal goals in going off-grid will all impact your decision of which type or combination of alternative energy systems is right for you.

## Geothermal 101

Even though at this time, I'm not going to be using geothermal power in any capacity as part of my own off-grid experience, I wanted to include it as an option in this text. That's because if you have the right type of property and can afford it, geothermal is a great option.

Geothermal is the only energy source that comes from the Earth itself. It's usually used for heating and cooling. Thankfully, the technology has come a long way, and now it can be used to generate power as well. Of all the alternative energy sources, I find geothermal to be the most versatile and reliable of all. After all, the Earth's core isn't going to cool down anytime soon! (And if it did, you'd have much, much bigger problems than which energy system to hook up to your new home. But I digress . . .)

The core of the Earth is around 8,000 degrees Fahrenheit, so the deeper you go toward the Earth's core, the hotter it gets. Obviously, there is a great deal of potential free, constant energy directly under your feet. Geothermal energy originates from the inner mantle of the Earth as hot magma (liquid rock) circulates upward while surface groundwater seeps downward. The magma then heats the water and forces it back up through faults and cracks in the Earth's surface. When liquid forms, this geothermal energy is referred to as hydrothermal. The best part is that geothermal can be tapped into almost anywhere in the world! Because of this, areas with volcanic activity offer the best geothermal possibilities, while highly elevated and mountainous regions offer the poorest.

The complexity and type of any prospective geothermal system will depend on how your area fits into the above rating system. There are many variations of geothermal energy systems, but I will stick with the basics for now.

## HOW A GEOTHERMAL SYSTEM WORKS

As stated earlier, the primary use for geothermal energy is the heating and cooling of industrial buildings and residential homes. However, with advances in technology, it is now also possible to produce small amounts of electricity.

A geothermal setup sort of works like the solar pipe heating systems found on roofs that heat pools . . . only, geothermal performs the same function underground. This is an oversimplification, but it is pretty close. In essence, with geothermal, you are taking advantage of the consistent temperature of the Earth, harnessing it through an underground piping system and then transporting it to the structure you wish to heat or cool. This piping system is called a “loop”; it can be an open or closed system.

The heart of a typical geothermal system is a ground-source heat pump that cycles water through the underground piping loop. Closed-loop systems circulate a water-based solution through a “loop system” of small-diameter, high-density polyethylene underground pipes. Closed-loop systems can be installed horizontally, vertically or in a pond or river. Open-loop systems use existing well water or surface water.

During the winter, geothermal heating and cooling systems absorb heat stored in the ground via the water that circulates in the underground loop. This heat is carried to the ground source heat pumps, where it’s concentrated and then sent as warm air throughout your home.

During the summer geothermal heating and cooling systems absorb heat from your home and transfer it to the underground loop, where it is then absorbed by the cooler earth. The geothermal

heat pump uses the cool water returned from the ground to create cool, dehumidified air for your home.

For a geothermal system to make usable electricity, steam must be produced that spins a turbine attached to a generator that then produces electricity. This is how traditional geothermal plants have produced energy for communities for decades.

## MY THOUGHTS ON GEOTHERMAL

As I indicated, I have no plans to use geothermal on my property. Early on in the project I did research this option and received a rough price quote for a system. For a complete, installed system, it was going to cost between \$30,000 - \$35,000, which is more than double what my solar and wind systems cost. What my research indicated was that residential geothermal systems can produce electricity, but only in small amounts, so they are really not cost efficient as you will still need a different electricity-producing system of some kind.

The biggest advantage of geothermal for people who live off the grid is that it makes it more achievable to have a modern central heating and cooling system. Another upside of geothermal is that, once it is installed, there are not a lot of additional costs. But because of the power that these systems typically use, they are usually not good options for off-the-grid living.

Now, if you are resourceful you can actually make your own geothermal system with abs or pvc piping, for next to nothing. There are plenty of forums on this topic that can be found via the Internet, so if you have the time and patience this could be a way to go. With that being said, the performance will not be as good as a professionally installed system, but from what I have seen when done right they work fairly well.

The downside of a professionally installed system, of course, is initial cost. Of all the alternative energy systems, I have found it to be the most expensive. However, even though it is the priciest, it is also the most versatile and consistent of all the systems. Again, it all comes down to your budget and goals.



# Generator Backup Systems

When I started my off-the-grid project, I knew very little about how backup generators fit into the equation. (I'll tell you more about my rookie mistakes in a minute.) To keep it simple, I will discuss the most common and basic systems in this section.

Backup generators can run off of any one of the following four types of fuel: propane, natural gas, gasoline, and diesel gasoline. The type that will work best for you will depend on your needs. For practicality and ease, the most popular free-standing generators run on gasoline. In contrast, your true backup residential generators usually run on propane or natural gas.

**FREE-STANDING (PORTABLE) GENERATORS:** These generators are fairly inexpensive and easy to find. The smaller ones can be hand carried, and the larger, heavier ones usually have wheels to help when moving them around. They typically range from 1,000 to 10,000 watts of peak power output.

The cost of a generator can range from \$200 to \$1,000 for an 800- to 8,000-watt unit (0.8kW to 8kW). They come with a pull starter or with a push-button starter (with some additional upfront cost).

The upside of portable generators is that they are cheaper and have a multitude of uses because they are mobile. The downside is that they usually run on gasoline, may still require professional installation to ensure you don't damage your existing alternative energy system(s), will have to be hand-started to charge batteries or provide additional power to your house, and they are very loud.

**MOUNTED (RESIDENTIAL) BACKUP GENERATOR:** These generators are what you will see in electrically insecure areas, such as neighborhoods in Florida prone to frequent power outages from seasonal storms. They are permanently mounted on a concrete slab, and will run off natural gas or propane. These are almost always automatic, meaning they kick on automatically once the power goes out.

It's important to note that these types of generators are used differently in an off-grid home, compared to typical on-grid

residential properties—even though the generator itself will be virtually identical. For an off-grid property, mounted backup generators are typically set up to start when your batteries drop below 50% of their charge, or another predetermined charge level, usually 60%. (We'll discuss why this is important to battery life in a moment.) This "start-up" level is programmed into the system.

You can also have them kick in when you use more power than your alternative energy system will provide, such as if you want to have all the electric appliances and creature comforts of a standard grid-tied residential home regardless of the capacity of your off-grid energy system.

These days you can build a very large and complex alternative system that can power almost any lifestyle you want, but it is cost prohibitive for most. For those who don't want to give up the creature comforts typical of grid-tied homes, a simpler and much cheaper alternative at this time is a hybrid alternative energy system with a residential backup generator.

Here's the "but": These residential backup generators don't come cheap. Per my research, on average they range from \$2,000 to \$4,000 for a 10,000- to 20,000-watt unit (10kW – 20kW), not including installation.

The upside is they kick in automatically and are far quieter than a portable gas generator. The downsides include: cost, necessity of professional installation, the fact that some manufacturers will not honor the warranty for off-grid use, the need for a permit and inspection for proper installation, and the necessity of having a large propane storage tank for a fuel supply.

## **MY SYSTEM AND RECOMMENDATIONS**

When I first started exploring an off-grid lifestyle, I thought I could just use alternative energy sources and that was it. Sometimes my simple thinking gets me in trouble.

Being a rookie, I didn't realize that going off the grid would

definitely require some type of backup power generator. I know what you are thinking, why the heck would you have to have a backup generator if you had a good alternative energy system?

Here's why. One: My county requires me to have one by code. Two: Stuff happens, and not having one is a bad idea. Just because you are generating your own power doesn't mean your system will run perfectly all the time. For example, some cloudy weather with little or no wind for a couple of days means I will not have enough power for my needs.

Moreover, the batteries available today are limited in what they can do. If you drain them below 50% of their storage capacity on a regular basis, it will negatively impact their longevity. That's why it's recommended that you use a generator to start charging them as they approach 50% of charge.

Plus, batteries are really expensive to replace and will last far fewer years than almost all other components of your alternative energy system. Make sure to factor battery replacements into the lifetime cost of owning an off-grid alternative energy system or you will have a nasty surprise in a number of years when they stop working well! The number of years your batteries last will depend on the technology you choose, how you maintain them, and how willing you are to (foolishly!) drain them of more than half of their charge on a regular basis.

Back to my novice missteps. I did know I would need a generator to initially work on the property with power tools, but my thinking was just to use a small portable generator. That would work fine for that purpose, but a backup generator adequate for off-grid living needs to be bigger than one appropriate for simply running power tools.

Another issue that surfaced concerned powering my well pump before my solar array was up and running. (Remember, even if you do not yet live at your building site, you may need water for things like mixing concrete, and unless you want to look into things like water trucks, a pump comes in handy!)

Thus it turned out that I would need a generator with enough power to run the pump *and* have a 220-volt outlet.

So, instead of wasting money purchasing two generators, I decided to purchase a larger mobile generator. I ended up getting a really good deal from Costco (no this is not an endorsement for Costco) on a Westinghouse 7,000-watt gas generator. It was on sale for \$599 with only \$50 for shipping. By purchasing this larger generator, I was able to kill two birds with one stone, and do it fairly economically.

Now, some of you may be thinking you can always buy a used generator. However, I recommend getting a new one if it is in the budget. Your generator is going to get a lot of use—especially in the beginning—so it is well worth the money. When it comes to used generators, you never know what you are going to get, and how many actual hours of use are on it. Thus second-hand generators are not always the bargain they initially appear to be.

Here's another caveat. The more power output you need, the heavier the generator will be, so make sure you take that into consideration. This is especially important if you plan to use it all over your property (when running power tools to construct an outbuilding, for example). With a full tank of gas, my generator weighs around 200 pounds, so unless you are one serious badass and lift trees with one arm, this will have to be included in your evaluation process. Mine does have wheels, but moving it in the dirt and getting up ramps or a slope takes some serious effort.

I do plan to have a permanent residential backup system down the road, but with the cost, the money is better spent on the construction of the house for now.

## Propane: An Off-Gridder's Best Friend

When I first began to think of going off-grid, with my mind in typical Gary-land, I initially thought I could get around using any

type of “paid-for” energy source on my off-grid property . . . that is, my original vision was that once I went off grid, I’d never have to pay for power again.

Wow, was I in for a slap-in-the-face reality check.

I even thought I would not need any propane-using appliances. This sounded great on paper, but turned out to be a definite pipe dream.

Here is the main factor I didn’t understand prior to construction of my house: the building code for my county requires my home to have a reliable heat source on each floor. So what does this mean in practical terms? Well, having just a wood stove for heat wasn’t going to cut it, I was going to have to have a non-portable heat-producing stove or heating unit that operated on a reliable energy source . . . thus, propane. Oops, didn’t see that coming! Obviously I’m living in a much colder part of the country (remember, I’m up in Washington state), so the county was making sure I didn’t do something stupid like freeze to death!

I know it seems a little invasive to force me to install a permanent propane-fueled heating source, but those are the rules. In the end, the permitting rules proved to be moot, since I was going to have to have a large propane tank installed to run other devices and appliances in the house anyway. Here’s why:

- An electric water heater, or even an electric tank-less water heater was not going to be an option since I wanted to rely on off-grid power generation. Now, if you have a zillion dollars and can afford your own super-huge private solar farm, this won’t be an issue. But for us mere mortals working within normal means, we need to think of conserving electricity. So, I would need to install a propane fueled tank-less water heater if I wanted to have warm showers.
- As stated above, I would need propane to run a permanently installed heating system to meet county building code requirements.

- An electric oven draws too much power, so I would need to install a propane oven.
- It is easy and practical to have a propane line running from a large storage tank to the house to hook up a gas barbecue or to power heat lamps.
- In the future, when I install a large backup generator, a large propane source tank will have to be installed to provide fuel for said generator.

As you can see, it is pretty difficult to get by without having a propane fuel source when living off the grid. It can be done, but I have found it is extremely difficult, especially if you are doing everything to your city/county building codes.

Here's another propane-related tip. If you don't have the initial financial resources to install an adequate alternative energy system (such as solar) when you first get going, consider that there is an entire market for off-grid, propane-powered appliances, such as refrigerators, freezers, heaters, stoves, and so on. They tend to be quite a bit more expensive than traditional electric appliances, but they are designed to either draw no electricity at all or to use standard alkaline batteries as an electrical power source, such as for the igniter for a stove.

Incidentally, this is how travel trailers are set up. Most of the appliances in my travel trailer run off of propane or electricity. As a matter of fact, if you want to experiment with off-the-grid living I highly recommend living in a travel trailer first, as they are set up quite like an -off-grid house.

For most of you, I recommend installing a large propane storage tank, or at the very least, get some decently sized portable propane containers. In rural places, most propane delivery companies are used to rough and out of the way places, so you should be able to get propane delivered, no problem. Well, that's true during the warm and non-rainy months. When the weather gets bad or winter comes, you will probably not be able to get propane delivered unless your roads are well maintained. That's something else to

consider when deciding on how much storage capacity you will need for your tank(s)!

## The Power Shed

A power shed is exactly what it sounds like: a shed that will house all of your alternative energy components (such as an inverter). Here are the benefits of using a power shed:

- It can act as both a power shed and storage shed.
- Depending on size, it usually does not require a building permit (this will vary between states and counties).
- The power inverter is a bit noisy (buzzes while power is being inverted for use), and keeping it away from your house means you don't have to be bothered with the ambient noise.
- Lead-acid type batteries off-gas hydrogen and oxygen when being charged or discharged. Due to this, by code (in many places), they require proper ventilation. So it's just easier and safer to keep them away from your primary living quarters.
- You can use the power shed as a template for your primary living structure.
- You can use it as a ready-made structure upon which to mount solar panels. (Caution: if this is your plan, make sure to build a roof that has southern exposure, can withstand the weight of the panels and racking, and is away from any shade-creating structures such as trees.)

For me, building a power shed was a great way to start my project. As described above, it gave me a place to store tools and other items, while continuing to work on the property. Trust me, if

you leave tools outside—or anything of value outside—someone will gladly come by and remove them for you. Just because you are remote doesn't mean no one knows you are there. In small communities, everyone knows what you are up to, especially thieves, so building a power shed is a great way to protect your belongings as well as your alternative energy equipment.

I also used it as a way to experiment with what type of siding, roofing, and color palette I would choose for the house. It is a heck of a lot cheaper and easier to change things on a shed than on a house, if you don't like them.

## A Final Piece of Advice

Be careful when selecting an electrician for an off-the-grid project, as a lot of them will tell you they are familiar with installing alternative energy systems, and they actually have never done it before; they just want the job. This happened to me with the first electrician I spoke to. However, the more I described my plan, the clearer it became that he had no clue how to do it. Needless to say, he fully intended to charge me for his learning curve. This is not to say a good electrician who has never done it before cannot figure it out—many certainly can—but a good one will not charge you to learn about installing alternative energy systems. I eventually found an electrician who had installed a couple systems that were purchased from Backwoods Solar, and he was the most helpful.

Even though solar and other alternative energy systems are becoming more popular, I quickly learned these type of systems are not usually entirely off grid. They typically are grid-tied (connected in some way to the public utility grid) or have grid-tied components. We off-gridders are still a unique breed, so you will have to figure out a lot of the necessary information on your own. The good news is that Backwoods Solar can be a huge help in getting you on



track, and in going the right direction. They can also help you with wind and hydropower. Their website is [www.backwoodssolar.com](http://www.backwoodssolar.com). It's repeated in the resources section at the end of the book.

## Putting It All Together

As you can see, there is a lot to think about when it comes to putting together an alternative energy system. The technology needed to live with (almost) all of the creature comforts you are used to already exists, but it is very costly. Most of us will need to pick and choose which energy-consuming devices are truly necessary, and which we can live without. In this way, we can all tailor our system(s) to fit those needs and desires.

The dream, 100%-efficient system would combine solar, wind, hydro, and geothermal. Hey, I think unicorns are really cool, but I'm not planning on seeing or riding such a mythological creature during my lifetime. The bottom line is: If we could each afford the perfect alternative energy system (and each lived on a property with the natural resources required for all four systems) our lives would be a lot easier, but that is not going to be a reality anytime soon.

Instead, we can all learn how to provide for ourselves a bit more (or a lot more!), and be less reliant on technology. This is not to say the aforementioned dream system will not be affordable for the average person in the future . . . but who knows when that will be.

When planning an off-the-grid lifestyle, I think alternative energy systems are the most challenging component for most of us to figure out. I hope this section gave some clarity to the subject in order to help you decide which system or combination of systems is best for you.

I know when I first started my research, finding simple and straightforward information on the subject was like trying to find

a needle in a haystack. There were plenty of books describing the engineering of alternative energy systems—replete with highly technical and difficult-to-understand information—but not much on how to decide what is the best option for the average Joe and Jane. I hope this discussion has helped remediate that problem.

## How to Use Less Energy and Be More Efficient

When going off the grid, one of the biggest challenges will be using far less energy than you did when tied to the grid. It can also be hard to get used to being continually cognizant of (and constantly monitoring) one's energy use.

What type and size of home appliances you can consistently power will depend on the size of your off-grid energy system and its capacity to store energy. The more money you want to spend, the more everyday appliances you can have and use. There are some systems that are so large, and produce so much electricity, that you wouldn't know the house is even off the grid. But for most of us, this type of super-system will be cost prohibitive. We will have to simply change our energy-use expectations and use fewer and more efficient appliances.

### THE THINGS YOU WILL PROBABLY HAVE TO LIVE WITHOUT

Many of the electrical devices you are used to using on a regular basis will not be practical with an off-grid power-generating system. This is because of their high power requirements—it just takes a lot of electricity to keep them going! Below is a basic list designed to give you an idea of the sacrifices you may have to make and the appliances you will have to do without.

As I have said, if you are willing to spend more money on your off-the-grid system, (usually in the \$25,000 to \$50,000 range), you

can probably use most appliances you are accustomed to enjoying. Improvements are continuously being made, not only in the energy output of alternative energy systems, but also in the efficiency of modern appliances. So this list is just meant as guide and is by no means definitive.

This list of appliances to give up applies for those of us using the traditional three alternative power sources: solar, wind, and hydro. Geothermal is a different, and much more expensive type of system, and not an option for most. Therefore, it will not be considered for this list.

These are the appliances and conveniences I recommend you simply learn to live without:

- Forced heat and /or air conditioning
- Microwave
- Dishwasher (not always; they are becoming more energy efficient)
- Full-size (large) electric refrigerator (you can have a small one instead)
- Free-standing electric freezer
- Hair dryers
- Space heaters
- Portable air conditioning or space heater units
- Electric stove/oven
- Electric water heater
- Electric clothes washer and /or drier

## **SOME EASY CHANGES TO REDUCE POWER USE**

Again, this is not an all-inclusive list, but I have found these to be the biggest and easiest energy tips to follow.

- Use propane-powered appliances.
- Hang-dry clothes during warm months.
- Install LED lighting throughout entire house.
- Install windows for maximum natural lighting. (This is known as “daylighting”)
- Install skylights for additional natural lighting.
- Turn lights off when you are not using them.
- Get the smallest and most energy-efficient refrigerator you can live with (this represents the biggest and most continuous power draw in an off-the-grid house).
- If you are building an off-grid property from scratch, consider using a passive solar home design, which helps collect, store, and distribute the sun’s natural heat throughout your home in the winter and helps reject it during the summer.
- Make sure your home is properly insulated.

For almost all of us, this energy-saving-lifestyle change will necessitate a big learning curve. However, with some energy-use reprogramming, you will soon wonder how you wasted so much power in the past.

## Chapter Summary

An alternative energy system is essential if you plan to live without any of the benefits (and associated costs) of traditional public utilities. You will need to consider how to heat your home, how you will run your appliances, and how you will keep the lights on.

The main off-grid power possibilities are solar, wind, hydro (water), and geothermal (underground heat of the Earth). The

feasibility of each depends heavily on the location of the land you choose to live on, including its topography, elevation, weather, shade (trees), and of course, local building regulations. Tax breaks and incentives may help cut the cost of your system.

A typical off-grid energy system stores energy in a battery bank. You will need a back-up generator as well. Reducing your energy consumption through energy efficient appliances and building techniques is a key way to make an alternative energy system feasible. Finally, think old-school and cut down on your energy consumption. This kind of “energy simplicity” may be hard at first, but will soon become one of the great rewards of living off the grid.

# Chapter 9

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## REMOTE COMMUNICATIONS, INTERNET, PHONE ACCESS

For some people, having any kind of phone or Internet access might not be that important. Indeed, some folks go off-grid to get away from the noise of technology. However, I think for most of us, especially those of us running our own businesses, having Internet access and cell phone coverage is a must. I know for me it was a crucial factor when selecting my property.

### **The Importance of Cell Phone Coverage**

Because of my work, the first thing I checked when I initially looked at my property was whether it had cell phone coverage. Luckily the cell tower was directly across from my property on another mountain range, so I have excellent reception. For me, not having cell phone coverage would be a deal breaker. This is especially

important if you plan to live in an area without the possibility of landline access and you want to have some type of phone.

Fortunately, today's ever-expanding cell phone coverage means there is usually a carrier in almost every area. At the very least, coverage is in the general area, so you may have to drive a bit to be within range. I do know people who have to do this to use their cell phone.

Bear in mind that in contrast to a city, in a remote area there is likely to be one cell phone company that has much better coverage (more towers) than the other major carriers. Ask around with the locals to find out who that is, and whose calls drop the least when driving between tower ranges.

Here is another really good reason to have cell phone coverage on your off-the-grid property: in case of emergency. Living an off-the-grid lifestyle is inherently arduous and dangerous. With more freedom comes more risk. Not only are you farther away from your closest neighbors but also from any type of medical help. In my situation, were I to get severely injured, there would be no way for me to get to medical help on my own because of the difficulty of my roads. Either a neighbor or life flight would have to get me, and a cell phone would be my only way to raise the alarm.

## **CELL PHONE BOOSTERS**

A cell phone signal booster (also known as a cell phone repeater) is a small electronic device that you put in your home to help solve the problem of weak reception. The catch is you have to have some type of reception for it to work (in other words, it won't work in an area with no cell signal whatsoever).

While building my house, I have lived in my travel trailer at a remote RV park that didn't have consistent cell phone coverage. Fortunately, I found a good booster that works really well in areas that have spotty or low-level reception. The brand of booster I have and still use is called the Wilson Electronics Vehicle Cellular Signal

Booster. Yes, it was designed for car use, but you can purchase the home adapter kit, and it works perfectly. I went from one bar of service to two to three bars of reception.

The downside is your phone has to stay in the cradle for it to work; the upside is it only cost around \$100 bucks for the entire kit (other boosters can cost upwards of \$400). I know a lot of people in the sticks who use this system, and for the money, it seems to be the one that works the best.

There are more expensive, and more powerful cellular boosters, but they require an Internet router to work. Now, if you have Internet access, this sounds great, but there is a catch. If you are living off the grid, you will not have hard-wired (underground cable) Internet access. Instead, you will probably have to use a Wi-Fi cellular device or satellite Internet, and these boosters will not work with this type of Internet connection. (More on satellite Internet and how it works later.)

## SECURITY COMMUNICATIONS

It's also a good idea to have cell phone coverage for your remote security system. We will discuss off-grid security systems in detail in a later chapter, but for now, it's important to note that some require cell service. For example, using game cameras that double as security cameras will require cell phone reception in order to send data directly to your phone, alerting you when there is movement on your property.

Sure, security systems can be operated with Internet access instead of cell service, but this creates a reliability problem. That's because routers, connectivity, and power systems can go down, thus requiring a reboot of your Internet equipment. If you are not at your property year round, this could be a big problem. In contrast, I have found the cellular communication cameras to be the most reliable, which is another reason I recommend choosing a location with cell phone service.



# Off-Grid Internet Access Solutions

Before going off-grid, I was very “citized.” This meant I was very used to having constant high-speed Internet access at all times. Now, as you can guess, going remote and living off the grid changed this big time. Luckily, I had experimented with Wi-Fi mobile Internet access through Verizon for a couple years before fully committing to an off-grid lifestyle, so I knew I would need to spend time thinking about how to get off-grid Internet access before buying land. But there was even a problem with that solution; the Internet worked fine at my property, but it didn’t work at the RV park I was staying at during the construction of my house. My cell phone booster worked great for voice calls, but didn’t work for data as it just had too much bandwidth (i.e. the signal was too “big” for the booster to handle).

This was a huge problem, as I need consistent Internet access to run my business. So I had to explore some other options, and that is when I started looking at satellite Internet companies. I remember back just a couple years ago hearing from people how slow and expensive satellite Internet access was. Nevertheless, I contacted a couple of satellite Internet providers and spoke with one of the local installers. This was how I learned that the technology has come a long way and is now a viable off-grid option, although with certain limitations and headaches that I will outline later.

Here is where my story got a little trickier. I soon discovered that satellite Internet performance is inversely related to participation; specifically, it’s based on how many users are on the node in which you participate. A node is the electronic device that is attached to a network, and is capable of creating, receiving, or transmitting information over a communications channel. The more users on your node, the slower your service will usually be.

Here is how it worked for me. The first service I subscribed to is the biggest and most well-known satellite Internet service provider in the United States, HughesNet. This is by no means an

advertisement or promotion of their service; it is just to show you an example of my experience.

At this point, I had never used satellite Internet, so I wasn't used to the lag time (the delay in connection speed), but even with that, my service seemed really slow. I thought I had an equipment problem. However, after discussing this with my installer, I learned that the node I was using on HughesNet was full, which was probably the reason my speeds were so slow.

Basically a node only has so much bandwidth (capacity), so once that bandwidth gets used up, you will experience slow speeds. This was a huge problem, and a big pain in the butt for running my business. The bottom line was that it just wasn't going to work at the speeds and performance I was getting.

My installer said he would do some research and see if he could find a better solution. Fortunately, this kind of research usually comes without bias in a rural area. This is because, in more remote areas, installers are usually independent contractors and will typically perform installations for numerous satellite television and Internet services. Thus, they can give you the real story on each one without prejudice.

After asking around, my installer found another satellite Internet service provider called Exede, which had fewer people on the node for my area. At the time, I thought this was fantastic, although this feeling didn't last (more on this in a moment).

Here is another important point when it comes to satellite Internet service providers: The installation is not free, and when you factor in the equipment purchase or rental (I recommend renting the equipment), it is not cheap. Also, some will *not* give you a grace period to cancel, so it can be an incredibly painful experience if you are not happy with the service.

HughesNet did have a 30-day cancellation policy, so I was able to cancel my service without having to pay some ridiculous fee. That being said, I did lose the initial installation costs, which was in the neighborhood of \$100, and then I had to pay the installation cost of the new service. In total it cost me about \$200 in fees, and

believe me, these companies are not going to make an exception and reduce those fees. Trust me, I tried!

Even with the costs of changing services, it was a risk because Exede didn't have the same 30-day "try it out" grace period that HughesNet had. If I didn't like the service or it didn't work out, I was told I would have to pay a steep cancellation fee.

Here is where things got interesting with my satellite Internet service. Exede worked great in the beginning, but then I started having serious problems. My connection kept dropping, and after many hours on the phone, and multiple service calls (at \$90 a pop!), I finally cried uncle and gave up. No one could get it to work properly, so after I patiently explained my issues, they let me terminate my contract early without penalty. I was only a couple months from the house being livable, so I knew my Wi-Fi hotspot through Verizon would work just fine, without all the headaches, once I got settled in.

So overall, my experience with satellite Internet service has been pretty crappy to be honest, and a huge waste of money and time. I have heard it go both ways—some people have no problems and then others, like me, have a ton of problems. If it is the only option and you are stuck, you will have to just live with the limitations and problems that come along with this type of service.

## SATELLITE INTERNET LIMITATIONS

As I've mentioned, satellite Internet has come a long way and is a better-than-nothing option if you don't have another choice. Nevertheless, it does have some serious drawbacks when compared to cable or grid-tied Internet services. Here is a list of the most noticeable ones I have found:

- Installation tends to be more expensive.
- There are fewer service providers.
- You need to have "line-of-sight" to the satellite for it to work. The installer can help you determine if you have this or not.

- If you are in a part of the country that uses an old satellite, your service will more than likely be crappy.
- Bad weather such as clouds, rain, or snow, can and will knock your service out.
- There is limited data usage; plans are usually in 5 GB increments.
- You will have to be creative if you download or upload a lot of music or videos, as most companies have unlimited data usage times, but these are usually during the time you are asleep.
- You may have to pay for service calls if your service goes out for any reason.
- It requires an area upon which you can install a small dish (just like satellite TV).

## A DIFFERENT RURAL OPTION: WISPS

A WISP (wireless Internet service provider) is another option for off-gridders in certain areas. Like satellite Internet, the technology has rapidly improved to make this a viable off-grid alternative to satellite Internet.

Unlike telephone or cable companies, a WISP does not need to run a physical cable to your location, making it ideal for rural and off-grid areas. Instead, WISPs use tower-mounted antennas to transmit and receive radio signals. So a WISP is similar to a cell service company in the way it mounts its equipment (often onto a cell tower, water tower, or antenna), but its technology and type of service are quite different.

To receive the WISP signals, you typically need a small dish mounted on your property. Satellite TV providers are similar to WISPs in that they deliver service to a fixed location that has a receiver dish. However, with satellites, the signals must travel such long distances that lag can be a problem. In contrast, the signals from WISPs travel much shorter distances and are typically reliable, fast, and relatively cheap.

Here are the drawbacks. Most WISPS operate regionally, not nationally, so not all areas of the country have them. Like satellite Internet, WISPs are negatively impacted by adverse weather. You will also need a clear line-of-sight to the tower or antenna from which the signal originates, which may mean cutting some trees and/or “bouncing” the signal off another structure and toward your home.

So, even if you are in the WISP service area, your home may not be able to take advantage of the service. However, if you can get WISP service, it’s worth comparing the prices and reliability to satellite Internet. As always, ask around with locals to determine what they have found works best.

## Satellite Television

Going off grid does not mean you never get to watch TV again, if that’s what you prefer. Although some people are happy to live without the boob tube, I know access is important for me. I’m a sports nut and just can’t live without television for that reason! Here are some solutions for still getting your favorite shows while living off the grid.

Satellite television has been around a lot longer than satellite Internet, and most people are familiar with these type of services. I know even when tied to the grid, I have used satellite TV instead of local cable services every so often. DISH Network and Direct TV are the two biggest satellite television providers in the United States. I have used both over the years. Which is right for you? It just depends on which types of channels and equipment you prefer. Although I have not actually heard of anyone not being able to get satellite TV service, I’m sure it is possible. However, for most off-gridders, satellite television is a good option.

I actually have two satellite dishes for my satellite TV services. I have a permanently mounted dish at my off-grid property, and another one that I mount to a portable tri-pod for use on the road.

I simply take my main receiver and portable dish setup with me when I'm traveling to use with my trailer. There are small, portable dishes made for RV living that automatically find the satellite for you, but they are really expensive.

They also have limitations, such as a lack of high-definition (HD) channels and no DVR capabilities. Yes, you will need to figure out where to point your dish if you use my method, but it is pretty simple. There are a ton of websites and YouTube videos that show you how.

## **A USEFUL TIP FOR SATELLITE TELEVISION AND INTERNET SERVICE USERS**

A final thought for those who want to do migrant, off-the-grid living like myself: All satellite television and Internet service providers I currently use, and have researched, allow you to downgrade your services for six months out of the year. So instead of paying for a full subscription all year, you only pay a small fee and your equipment rental fees (if you do not own your equipment) for up to half a year. This is a great way to save cash if you only live at your off-grid property part time, and you are in a different area for some of the year.

## **Chapter Summary**

Especially in areas with no possibility of a landline, make sure to consider phone and Internet connectivity before purchasing a property. You may be restricted to choosing from one main cell service carrier, and it's possible you will need a signal booster to optimally use your cell phone. Cell phones are great for business and emergency communications, as well as monitoring your home security system remotely.

Viable off-grid Internet solutions include satellite Internet and regional WISPs. Both have practical limitations, but with

some local research you will probably be able to find high-speed Internet options suitable for an off-grid home in your area. Satellite television is available for folks like me who enjoy occasional TV time. Indeed, thanks to today's technology, many modern telecommunications options are available and efficient, even in the most remote locations.

# Chapter 10

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## OFF THE GRID FINANCING— BRING CASH AND CREATIVITY

Now that you have your dream off-grid plan, you are going to need to pay for it. This means that—unless you are sitting on piles of cash—you will need to organize financing.

This is where it gets tricky. Probably the most valuable lesson I learned during this project was how incredibly difficult it is to finance an off-the-grid property using traditional means.

Before I get started explaining the interesting financial aspects of off-grid properties, I need to be clear: I'm not a financial expert, nor do I play one on TV. I'm only sharing the techniques I have used, and what others have used in this unique life adventure to make our dreams a reality. They are meant as examples only. Once you have your rough plans in place, it's best to speak to an actual tax and/or financing professional to make sure you have all your ducks in a row. Also, not all financial institutions will provide the same terms as mine. Don't assume you can follow the same method without thoroughly researching all options available to you in your unique situation.



Here is how it played out in my case. When I first started the project I thought, as with past houses I have owned or built, I would be able to get a construction loan or a traditional home loan. Not only was I wrong, I was *way* wrong with this assumption.

I soon found out that traditional institutions simply won't finance off-grid properties. I spent a great deal of time trying to find someone who would finance my off-grid home, and found not a one. After discussing my project with a particular lender specializing in VA loans, they indicated that banks would not finance houses that are not tied to public utilities, as they consider this type of property to be way too risky an investment.

I found it interesting that banks had no problem financing people with hardly any earnings or job security during the housing boom, but with us off-gridders . . . there was no chance.

Back to the drawing board I went. The lender indicated if I were to run utilities to the property, even if I didn't intend to use them, I would be able to get traditional financing. So off I went to the public utilities division of my county, hoping there were utilities somewhere close to my property. It turned out that the closest utilities were over a mile away. In theory that doesn't sound all that far, but when you are talking about running utilities in a rural area, that is a long way. I would have to pay privately to have them brought that distance to my building site.

The quote for doing so came back at over \$80,000! In addition, they wouldn't be able to run the cables underground, so it would all have to be done with above-ground power poles. The entire \$80,000 would be due right away as well, since this type of project would have to be paid entirely up front, before work began.

Even if I could poop out gold nuggets to pay for the utility run, I would have to get permission from every owner of the properties upon which the poles would need to be installed in order to have the utilities reach my property. I think you are starting to see how quickly this became far more complicated and expensive than I thought it would be.

Basically, I would have to spend \$80,000 cash, as I'm pretty sure they wouldn't take pelts in trade, just to secure financing for my

property. I had paid a little bit of attention during my math classes, so I came to the quick decision that this was not a good idea.

## GETTING CREATIVE TO GET THE JOB DONE

I quickly realized that paying cash was going to be the only realistic way to go. This meant the project was going to have to be done in phases, per my cash flow. The big advantage of this method, should you choose it, is that when the project is done you are debt-free. The down-side is that (unless you are independently wealthy) it could take forever to complete your home. This was something I faced because I come from a long line of poor people and there is no bank of “Gary’s Family” from which to borrow.

I decided to look into getting a personal loan to make the project go faster, but I soon realized the interest rates were ridiculously high. They were just as high or higher than my credit card interest rates. Well, that started to get the hamster running on the wheel in my head, and I realized I’m always getting “zero percent for 12 months” convenience check offers from my credit card companies. Being a good self-sufficiency survivalist, I always ignored these because I believe in being debt-free.

However, when you are talking about having to come up with big chunks of money, you sometimes have to make some compromises to get the job done. I decided I would cap the money I borrowed to a number that was manageable for me, so the debt would be controllable.

After talking with my local bank, I found another great nugget of information: Just because you can’t finance the property by traditional methods, doesn’t mean you can’t get an equity line of credit once the house is completed. In addition, they will wrap other short-term debt (credit cards, car loans) into the equity line if you want.

Now, do you remember how, throughout this book, I have recommended always building to code, pulling the proper permits, and just generally doing everything according to local laws?

Here's where this comes back into play. In order to get a home equity line of credit, you will have to have an owner occupancy certificate. The only way you can get this certificate is by owning a home that passes all inspections and meets the building codes of your county upon completion. Completion can mean 95% done, or close to completion. This nuance is at the discretion of the county inspector's office and the bank. Ultimately, to get the equity line of credit, you will need to satisfy both the county inspector's and the bank's requirements.

You are now seeing why doing things right has far more advantages than trying to buck the system and cut corners.

Later I found out that this is the method most people use to complete off-the-grid houses. They leverage short-term debt in order to get the project done, and then wrap the debt in a home equity line of credit that can be spread over 10-20 years. I thought I had created this strategy all on my own, but it has been done before.

Obviously I do not recommend going into debt beyond your means, nor is this a blanket endorsement of the above method. In my situation, I found this to be a good way to go, but it doesn't necessarily mean it will be right for you.

## Chapter Summary

An off-grid construction project may be considered non-conforming for mortgage purposes, and you will probably have to consider non-traditional financing. A home that is not hooked up to a utility grid, or a small house on a huge property, can easily make traditional lenders nervous. So, you may have to pay for your project in cash and/or take out a personal loan (although interest rates will impact the feasibility of the latter). My solution included using zero-interest credit cards and (in the future) an equity line of credit.

However, I advise you to speak to your accountant and financial institution before making any decisions about your own situation. The bottom line is to be aware that financing your home, energy systems, tools, septic system, and other building costs must be thoroughly considered when making your move off the grid.

# Chapter 11

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## COMMON TYPES OF OFF-GRID HOME CONSTRUCTION

Deciding which size, materials, and type of construction to use for your home will depend on many factors that are specific to you. There is no cookie-cutter method when it comes to living off the grid. For everyone it is a new and subjective type of experience.

As I have said in many chapters in this book, this section is not intended to be an all-inclusive, highly detailed manifesto on all “green” or off-the-grid homebuilding options. There are so many choices when it comes to construction, there is no way I could cover it all. Instead, I will cover the most common home types that are used for off-grid houses. These were the designs I researched and believe to be the most practical for the majority of people who want to live this type of lifestyle.

Since I started my project, I have met several people who have built off-grid houses, and the common theme has been that—construction-wise—every project is very different. I have yet to meet one person who has done it the same way as someone else.

The key factor in all off-grid home construction is energy efficiency. Unless you have unlimited resources to invest in a giant alternative energy solution, this should always be the biggest factor guiding your construction decisions. Off-the-grid houses have to be able to retain heat when it is cold and stay cool when the temperatures rise outside because most lack a centralized, forced-air heating and cooling system. Indeed, these types of creature comforts—as well as other energy-guzzling appliances—just take too much energy to operate.

With off-the-grid construction, most houses and structures are built with “green” or recycled materials. These are materials that are considered more environmentally friendly, and in most cases have better insulation values, thus conserving more energy. Building materials typically considered to be ‘green’ include lumber from forests that have been certified to a third-party forest standard; rapidly renewable plant materials like bamboo; and recycled stone, recycled metal, and other products that are non-toxic, reusable, renewable, and/or recyclable.

Simply put, green building practices aim to reduce the environmental impact of the building process. There are many different ways to do this, and again, it is highly subjective. With that being said, be careful, as many contractors have caught on to this trend. Many will call themselves green builders, and they are anything but. Instead of being truly environmentally conscious, they are just looking to relieve you of some of that green material in your wallet.

## Standard Construction or “Stick” Construction

Standard or stick construction is what I consider to be the cheapest, and I believe, the easiest type of construction. This is the construction method used to build the majority of the houses in the United States today, primarily because it is cheap, quick, and takes

the least amount of skill (my opinion). Standard construction usually consists of a concrete slab/foundation, but can have a raised crawl space, framed with standard 2x4, 2x6, or 2x8 pieces of wood, depending on your insulation and construction strength needs, and on local building codes. This is the type of construction you will see in almost every neighborhood in the United States. A perfect example of this type of home is the standard tract house.

The advantages of stick construction are that the materials are easy to find and are “off the shelf” (you don’t have to order them from a specialty manufacturer). Although it’s almost exclusively used by general contractors, it can be do-it-yourself (DIY) project and usually requires no special tools. The disadvantages are that this type of build is usually not energy efficient, is typically not fireproof (this is a big deal in densely wooded areas), and is not as stable as other types of construction in high wind areas.

## Straw Bale Construction

Straw bale construction is becoming increasingly popular for people living off the grid. These types of houses are usually built in low humidity areas due to possible moisture and rot issues.

Straw bale construction employs bales of straw as a structural and insulation material. The straw—which is simply dried stalks of grain—can be from a variety of crops, such as wheat, rice, rye, or oats. Bales can also be made from other fibrous materials, such as bean or corn stalks, pine needles, or any kind of grass.

The easiest way to describe straw bale construction is to think of hay bales stacked on top of each other with construction framing for structural support. The whole thing is then sealed with a stucco type of material. So, if you use straw bale construction, you will still have to frame your house, usually in a manner that is similar to the standard stick construction mentioned above (using traditional framing is usually the only way to meet structural code requirements with a straw bale approach).

The primary advantage of this approach is that straw bale homes have very high insulation values, thus making them very energy efficient. Another supposed advantage is that it can be an inexpensive type of construction, although I have not found this to be true. From my research and talking to people who have gone this route, it is far more expensive than what many building magazine and blog articles would have you think.

I believe this is because the straw bale method is considered a specialized type of construction (therefore requiring specialized labor and/or materials that are not readily available) and presents the challenges of trying to get this type of structure to meet local building codes (again, extra time and money).

The disadvantages of straw bale construction are an increased susceptibility to rot due to moisture, the difficulty of obtaining insurance coverage for this type of home, infiltration by pests and rodents, and large space requirements for the straw itself (walls can be two to three feet thick).

## Log Construction

Log construction has been popular for a very long time, especially in wooded or mountainous regions. Such areas are usually remote and difficult to reach, so using the surrounding trees as your primary building materials is an easy and practical way to go.

Log construction is simply the practice of stacking notched tree logs in an interlocking pattern. This is how a standard log cabin is built. Log cabins today range from basic to very complicated and ornate. I know a lot of popular “simple living” type of TV shows have made the log cabin look incredibly simple and cheap to construct, but this is usually not the case. I do know people who have built a log cabin without any outside help, but that is not the norm.

Conversely, log cabins are usually very expensive to construct when using a general contractor and can be flat out dangerous for



the inexperienced “do-it-yourselfer.” Think about cutting, moving, and stacking logs that weigh several hundred pounds each. Sounds like a perfect combination of dangerous activities by which you can get yourself seriously injured or killed.

Don’t get me wrong, pioneers did this type of construction all the time, but they were a little tougher and more skilled in this area than us modern softies. If you are going to try it anyway, always keep your cell phone handy or have a friend work alongside you. The last thing you want is to be injured during construction, alone in a remote area, and without any way of calling for help.

The advantages of traditional log cabins are that they are built from green renewable materials, they are energy efficient and durable, it usually doesn’t take much time to construct a cabin, and they look fantastic. The disadvantages are that they can be expensive to build, must be constantly maintained since wood dries and settles, they need constant exterior care, they can be fire hazards, and pests and animals love wood (so your home might become their dinner table and home as well).

Originally, I really wanted to build a log home, but it was just too expensive and would require too much future maintenance for me to even think about. I did contemplate going full blown DIY and using the trees on my property, but I just didn’t have the knowledge or skills to go that route.

Finally, one of the main goals for my structure was for it to be virtually fireproof, so a log cabin was definitely not the right option in the end.

## **Cinder Block/Insulated Green Block Construction**

In this section, I will discuss both standard cinder block construction as well as green brick construction, since they have a lot of

similarities. The only real differences are what the blocks are made of and the insulation value of each.

Cinder blocks are made from a combination of Portland cement and cinders (the dusty remnants of burned coal). In contrast, green brick products are usually made from recycled wood chips and concrete. Green blocks made from recycled wood have a higher insulation value than standard cinder block.

Styrofoam walls filled with concrete have also become very popular but are not really considered green construction. They do have an incredibly high insulation value, however. The downside is that it tends to be a prohibitively expensive type of construction, so I will not be discussing this method.

Block construction is very basic and many industrial and commercial buildings use this type of construction. It simply involves stacking concrete or green blocks into walls and filling open cells with concrete and rebar for strength.

The advantages are: a low cost, lower insurance premiums, durability, pest/animal resistance, ease of construction, lower maintenance, good insulation value, outside-to-inside noise reduction, plus, they are fireproof. The disadvantages are that they can be ugly if left unfinished, and it's more difficult to route electrical wires, plumbing, and other cabling within the house.

For me, after weighing cost, ease of building, location, and the need for a high insulation value, I decided to go with a recycled block product called Faswall. I don't intend to endorse one type of construction over another. There are a lot of factors you will have to consider when picking the type of construction and materials that are right for you. There are many other types of construction that fit into the off-the-grid lifestyle, but I feel the above are the most commonly used, and the easiest to research.

Some of you may even decide to combine different methods of construction. Heck, you might even invent your own. Just remember the farther you get from some of the more common construction methods, the harder it gets to comply with modern building codes, and this will almost certainly mean higher building costs.

# Getting Your Hands Dirty—The Right Tools for the Job

Unless you have unlimited resources, plenty of time, and the patience to have others do your work for you, you will probably have to learn a lot of new skills as you construct your off-grid home.

First, when constructing and living in an off-the-grid building, it is essential to have a good set of tools. Growing up in the sticks, I have had at least a basic set of tools since I was probably around 10 years old. That bike and Evel Knievel jump ramp were not going to build and fix themselves. (For you youngsters: Evel Knievel was a famous motorcycle stuntman.) So very early on I was using my hands, my own tools, and my Dad's tools to fix and build things (without his permission . . . most of the time).

Once I got older and purchased my first property, these tools and skills became incredibly handy. As any homeowner knows, things constantly need fixing! I still had a lot to learn, but knowing some basic fix-it principles was a huge help.

After realizing that contractors are expensive and (usually) a pain in the butt to deal with, I started doing most of the work on my homes myself. I actually did almost all the remodeling work on my first place by myself. Truth be told I didn't have a clue what I was doing, but I purchased numerous books on home renovation and just figured it out. Today, YouTube has a video on pretty much every type of remodeling or building project. This makes it far easier to learn these skills and to see how they are performed.

A word of warning: any idiot can make a video and post it on YouTube. I saw a show recently showing a young couple who decided to build and live remotely exclusively using YouTube videos for their information. I haven't seen an update to see if they have been eaten by a bear or starved to death, but it looked like they were well on their way to that.

Of course, you will still need tools to get the job done. Here are some of my favorites.

## HAND TOOLS

Instead of giving you a long list of basic tools, I recommend you get a “homeowner’s tool set/kit.” These are basic sets that contain a multitude of tools commonly used for homeowner projects such as a hammer, screwdrivers, wrenches, a socket set, a tape measure, and so on. These usually run from \$50 to \$100 for a decent starter set. The reason I recommend this for beginners is that it’s a cheap and easy way to get started. Tools can be very expensive, so until you get more familiar with them and figure out exactly what you need, the tool kit is a great way to get started and figure it out. As a matter of fact, I carry one of these “homeowner tool sets” in my travel trailer, so I don’t have to carry a bunch of expensive individual tools that I will probably not use on a regular basis and will just take up space.

## POWER TOOLS

Over the years, there is a basic set of power tools that I have used for a majority of my handy work. Here is the list I think everyone considering an off-grid journey should have:

**DRILL/DRIVER** is primarily used for drilling holes but can drive screws and small bolts.

**IMPACT DRIVER** is used primarily for driving (or removing) screws and bolts. Differs from drill/driver in that has more torque and has a fast-moving hammer that continually pounds the bit, letting you ease up on the pressure you would normally have to exert.

**SAWZALL** (reciprocating saw) is considered the workhorse of demolition tools, as it is compact and can cut through wood and steel.

**CIRCULAR SAW** (skill saw) is a small handheld saw that can cut most wood construction materials. Different blades allow you to cut through concrete and steel as well.

**MITER SAW** is more of a specialty tool but one I have used a lot over the years. This will make quick work of miter cuts (angled cuts),

such as those used on baseboards, crown molding, and cabinet finishing work.

**CUT-OFF GRINDER** is, for me, probably one of the most versatile tools I own. For a metal fabricator, this is a must-have tool, but it can also be used to make difficult cuts with different blades on wood, concrete, and tile. I have primarily used this for cutting steel or metal piping and for tough angled tile cuts.

With the advancement of cordless tools, we off-the-grid enthusiasts now have a great set of resources to perform jobs that, in the past, used to require a generator and extension cords. You can get a decent set of the above listed tools, cordless, for about \$500 to \$600. (Note that you will still have to plug in the battery chargers for cordless tools somewhere, but they become ultra-portable throughout your work site without the need for wires!)

The contractor (professional) grade of these cordless power tools costs more because they usually have more torque and a longer battery life.

Now if you have never used power tools before, I wouldn't recommend you buy a set and just go for it. There are many professionals in the construction business missing fingers because of accidents. Power tools are very dangerous and can injure or even kill you or someone else if used improperly.

If there is a large hardware store (such as Home Depot) in your area, consider attending one of the numerous how-to classes they offer on home improvement and tool usage. These classes are typically free, so the price is right! The last thing I want to see is someone who read my book missing a finger or hand, so always educate yourself first on how to use tools with which you are unfamiliar.

One more safety tip, and I can't emphasize this enough: always, always wear eye protection when using power tools. As a matter of fact, I would recommend safety glasses when using any type of tool. I have lost count how many times a piece of debris has been deflected away from my eyes and I was spared injury because of safety glasses. I have multiple sets of protection glasses, so I always have access to them. They are cheap and readily available at any hardware store.

Also consider industrial noise-blocking earmuffs, especially if you frequently use power tools (there are a lot of long-time builders out there with hearing problems!), and a hard hat if there will be overhead hazards at your work site. Again, all are inexpensive and easy to find at the hardware store.

## YARD TOOLS

This is a pretty basic list of yard tools to get you started. Depending on your project, and the type of yard you plan to have and maintain, this list may quickly expand. However, I have found these five yard tools are the ones I have used the most.

**DIGGING SHOVEL:** talk about one of the oldest, but most-used tools around today. Dig holes, move dirt, move rocks, mix concrete, chop tree roots, take care of that annoying . . . the many uses just keep on going.

**POST-HOLE DIGGER** (manual, not powered): if you live off-the-grid or in the sticks, digging fence postholes is going to happen. It is a cheap and back-saving tool that I highly recommend.

**STEEL RAKE:** this is not to be confused with a leaf rake that is for those yuppies in the suburbs. This is the tougher version with teeth spaced farther apart and made of hardened steel. You will be raking up many types of heavy debris and smoothing dirt on a remote property, so this is a must.

**HAND AX:** most off-gridders will have trees on their property, so a small ax is a great tool for cutting down small dead trees and removing limbs without having to use a chainsaw.

**WHEELBARROW:** besides moving dirt, debris, materials, and tools around, it is a great tool in which to mix concrete by hand.

Obviously there are many more tools that can and will be used on your off-the-grid property. But over the years I have found the above tools to be the most commonly used in everyday projects. Depending on your preference of buying used or new, the price of the tools will vary. Even if you decide to purchase all these

recommended tools brand new, they can be all be had for well under \$1,000 if you take your time when shopping and get them on sale.

That is not bad when you consider that—with some creativity—you could build an entire house with just these recommended tools. Tools also hold their value well, so you can resell them fairly easily down the road if you exit the off-grid life.

Conversely, if you don't buy these tools, you are going to have to pay someone who does own tools to come and do every handyman and yard project that pops up. Over the long run, that will be much, much more expensive.

## Chapter Summary

There are several main home-building techniques used in off-grid home construction, but there is no one right way. The most common types are stick, straw bale, log, and cinder block construction.

Energy efficiency and insulation are the most important factors to consider. Green building materials and practices try to reduce the environmental impact of new-home construction. Be wary of contractors promising great things that actually don't share your goals of building a truly eco-positive home.

In the long run, it pays to spend some money up front on basic hand, power, and yard tools. You can learn some basic building and handyman techniques from books, online resources, and free classes at your local big-box building supply store. This will allow you to better supervise contractors, fix their mistakes, and maintain your home on the cheap.

# Chapter 12

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## OFF-GRID SECURITY

We often think that living remotely and off the grid means the problems we had in modern, urban society will not affect us. This is sadly not the case, as criminals live in both rural and urban areas. Off-gridders often ignore or greatly underestimate the importance of off-grid property security.

In this chapter, I will describe how I also underestimated the immediate need for an effective security system for my own property, and how you can avoid the same mistakes I made.

### **No Matter How Remote, You Are Not Alone**

When living more remotely, some people assume that they will be able to completely disappear, and that no one will bother them. From my experience this is not true at all.

I'm not saying that if you really want to live like a hermit, that



you cannot remove yourself from human contact. However, I would say this is a pretty rare goal and the exception rather than the rule. In most instances, no matter how you decide to start your off-the-grid lifestyle, you will be surrounded by other people and have neighbors. They may be farther away, but they will be there even if you can't necessarily see them.

Here is another lesson I learned: People living remotely are much more in tune to new people moving into their area compared to people living in a more urban area. The populations in rural areas are typically less transient and more self-reliant than in the city, and someone buying property nearby is newsworthy. In fact, before you sign the final purchase agreement on your property, people will be talking about you—the new kid in the neighborhood. Remember that in small communities, information travels quickly and usually everyone knows everyone, so trust me: they will know you are coming, and what your plans are, before you unpack that first box.

I think a really good example of this phenomenon was demonstrated on the show *Alaskan Bush People*. This show was based on the lives of a family who lives completely off the grid in remote Alaska. They bought a new, very isolated property in the Alaskan bush, and if I remember correctly, their closest neighbor was around five miles away.

Nevertheless, their neighbors immediately knew who they were. Obviously because they were filming a new and popular reality show, the information traveled faster, but even without that, word-of-mouth carries quickly. The newly arrived family soon found what they were doing was not exactly popular among some of their neighbors, even though they were miles away. Due to numerous threats to them and the film crew, they eventually sold their land and moved. Sure this could be just made-up TV, because today almost all reality shows are scripted, but I bet at the very least there was some truth in the above situation.

Now this is not to scare you away from off-the-grid living, but to enlighten you that you are going to have neighbors, and they

are going to know about you no matter how far away you put your home. Humans are curious creatures and they love to talk, and that doesn't change in off-the-grid living.

## Lessons Learned—Why Security Should Be a Priority

So what was the biggest mistake the *Alaskan Bush People* family made in my opinion? They ignored perimeter and overall security. Not to say this would have mattered in their situation, but it would have definitely been a deterrent.

When I began my off-grid lifestyle, I had a plan for my perimeter and basic security, but the mistake I made was not making it a priority. In my naïveté, I thought no one would really know or care what I was up to until I got much further in the construction and development of my property. Not only was I wrong, but I was wrong big time.

The first clue was when a neighbor in the area sat just off my property line and watched the initial construction of my road for an hour or so. I took this as just basic curiosity, which it could have been, but shortly after that I had an incident that made me put my security plan into motion, and much more quickly than I had intended.

Not too long after getting the roadwork completed it, was time to get the well drilled. At the time I didn't realize this, but eyes were on me and on what I was doing. You'll remember that the drilling rig was not able to get to the top of the property and had to be towed by a bulldozer. We barely got it in place before dark. This was on a Friday, so the drilling rig would be up at the property over the weekend with no one up there (my house wasn't constructed yet). At this time, I had no fences, gates, or security cameras.

My attitude was that there was nothing of real value on the property, so it wouldn't be a big deal. That was another mistake. I

live in a very wooded area known for logging . . . heck, my property was a former logging site, and tree poaching is a huge problem in the area.

This is not to say I didn't think of setting up a security system for the property initially. I had, but there was another concern. I didn't know if I was going to have a water source until the well was drilled. So setting up a security perimeter and/or system was a financial risk, because if we couldn't find water I was going to have to re-evaluate my plans for the property.

Call it spider-senses or just dumb luck, but something made me head up to the property the morning after we got the drilling rig in place. As soon as I got up to the spot where the drilling rig was parked, I noticed something seemed out of place. I did a quick walk around the rig and noticed one of its hoses on the ground and drag marks leading away up the hill to the other access road at the top of my property. Upon further investigation, I noticed some small truck tire tracks and shoe prints from more than one person. I immediately called the drilling company to let them know their drilling rig seemed to have been messed with, but I was unsure if anything had been taken.

When they showed up Monday morning, they did an equipment check and found the tire chains and hold-down straps had been taken. These items were unsecured on the outside of the rig. Thankfully, no windows were broken, nor was there an attempt to break into the drilling rig, and no other vandalism had been done. As you can imagine, though, I was more than upset that someone had stepped foot on my property and stole something before I had even started any real work.

Initially you might say this was a really bad start to my project, but now I look back and consider myself lucky. What it did was open up my eyes to the fact that, just like any place in this country, people are looking to do you harm. Because this happened early on, I put my security plan into hyper-drive, and that simple fact probably saved me a lot of grief. If I had continued to wait to implement my security plan, someone could have definitely stolen items of much more value.

Now I'm not totally naïve. My original plan was to build the solar/storage shed as soon as we found water. This would be the place to store tools, and other items of value, so they would just not be out in the open. But I quickly learned my lesson—one that I hope you benefit from as well.

## IMPLEMENTING THE NEW PLAN

Instead of focusing exclusively on the power shed, I realized I needed to button up the access roads to deter people from entering my property. That would make it impossible for them to drive a vehicle right on my property, at least not without a hassle. It is a lot harder to haul items off by foot than it is to drive right up and load a vehicle or ATV and then drive away. In my professional experience in law enforcement, most thieves have not been the most motivated individuals in life, so the harder you make it on them, the less likely they are to target your property.

Also, keep in mind that in rural areas, especially if your property has not been lived on for a while, well-intentioned locals may use it for hunting, hiking, or ATV rides. The good news is that this kind of person will eventually stop if you put up some basic gates and signage indicating the property is now private and in use. Of course, there are also thieves who need more clear indications your land is not easy to trespass upon.

Reducing easy access was my first priority, which meant placing gates (I chose re-enforced chain-link gates) in specific locations on my access roads. Here is where the hard-won lessons I learned in my previous career when dealing with security elements overseas came into play.

My advice: In order to really make it difficult to access your property and discourage would-be thieves, you need two security access points for each road. Basically, someone should have to get through two security points instead of the usual one that most people use. Does this mean more costs for gates and fences and the like? Yes, but trust me it is well worth it!

# My Security System and Recommendations

This is not going to be a tell-all about my security system and how I have it set up, but I will give you the nuts and bolts of what has worked for me, so that you can also implement a well thought-out security system for your property. Of course, you will have to alter my plan as needed once you determine what you are comfortable with financially and depending upon which security system best suits your type of property.

## Why Gates Are a Great Place to Start

To decide where you want to put your initial gate or road-access blocking point, first figure out where it will be most difficult for someone to circumvent the gate (drive around it) with a vehicle or ATV.

There is no perfect security system. However, what you are trying to do is make access more difficult and to discourage people from targeting your property. Putting in fences and gates isn't cheap, and on large properties, it is not realistic to fence the entire perimeter. In most cases, you must pick and choose the best locations for your gates and fencing. To get the most bang for your buck, start with gates.

### **DON'T GO CHEAP ON GATE MATERIALS**

One of the biggest mistakes I have seen over the years is the average homeowner's tendency to just throw up the most inexpensive gate they can find. Don't do it! You have to look at your gate as the entryway to your way of life, so this is an incredibly important part of your security system. When someone sees a well thought-out and robustly manufactured gate, they know you mean business, and it sends a strong message.

I don't know how many cheap gates I have seen smashed into a pile on the side of someone's property entry road over the years. When I see this, I have a pretty good idea of what happened, and it probably isn't good.

The pole to which your gate is mounted and attached needs to be as strong as possible, as this will be the primary failure point if done on the cheap. I used four-inch galvanized eight-foot poles for my gate attachment and latch points. Each one weighs around 100 pounds so these are seriously strong poles. These are the same size poles you will usually see on corner security fences that house things like heavy equipment, or storage units.

I then dug, and in some cases air hammered, two-foot-deep holes and filled them with one and one-half to two 80-pound bags of concrete to make sure these were absolutely as strong as possible. In addition, I filled the inside of each of the four-inch poles to within six inches of the top with concrete. You can now see that each pole consists of about 300 pounds of steel and concrete.

You are probably asking why would I go to the effort of filling the poles with concrete? For two reasons. First, if someone (including yourself) runs into it with a vehicle, it will not dent or bend the pole, therefore ruining your hard work. A bent gate pole is pretty much useless, and replacing one that is this size is not fun. Secondly, if some genius decides they are just going to cut the pole down, they are going to get a nice surprise when they hit the concrete. I'm not going to candy coat it: putting in poles this size is a lot of work, but once in, they are rock solid and are not going anywhere. Sure, you can use wood to save money, but a determined thief can make quick work of them with just a hand saw.

Now that you have put all this time and effort into your gate poles, don't just throw up any gate. Make sure it is strong and reinforced. My gates and fencing are all chain-link, but there are many ways to go when it comes to gates. Considering the money and the ease of setting it up, I have found chain-link fencing a great choice. Chain-link fencing now comes in different colors, so if you don't like the look of it, you can now get it in a color that lets it fade into the landscape.

The other thing I like about chain-link fencing is the ease with which you can install barbed wire on top. There is no better deterrent than three-string barbed wire at the top of your fence. I have barbed wire on all the fencing and gates I have installed to date. Again, ol' Johnny Dirt Bag doesn't want to get all cut up, so this will definitely make him think twice about jumping over your fence.

One last little trick to help secure your fencing is to either spot weld or to apply JB Weld (an epoxy that bonds to metal) to all the fastening nuts and bolts. You have to love thieves; some spend a lot of time and energy trying to figure out how to steal your stuff. By welding or putting JB Weld on all your fence fasteners, you make sure they will not be able to unscrew your fence attachment points and just walk or even drive right in. Getting easy access to your property usually means unscrewing only three or four bolts on the connection pole of your fence. This trick stops them.

As I have said, there is no perfect system to keep people out. You just want to make it as hard on them as possible. The more time they have to spend trying to get onto your property, the more likely it is that someone will see or hear them, not to mention the fact that you will get some nice video or photos of them on your security cameras.

## Security Cameras

I've spent many, many hours researching video camera systems, and let me tell you, there are a ton. They can range from very simple cameras that cost less than a hundred dollars, to complex systems costing thousands. The technology is changing so quickly that I will not dedicate very much time to this subject, as it will be outdated by the time this book is released. Your choice of security camera will also be highly specific to your needs and your type of property.

I will say this: When it comes to home security camera systems, the sky is the limit. There is a camera solution for almost any

situation. Systems are now even completely wireless and can be quickly installed by the non-professional. In addition, most can send data straight to your computer and cell phone in real time, which is especially helpful if you are not at your property year round.

## USING GAME CAMERAS FOR REMOTE SECURITY

A game camera (also known as a trail camera) is a remote camera designed for hunters. It is weatherproof and built for extended, unmanned use outdoors. It can be mounted to a tree and is used to record video or still images. Game cameras are motion-sensitive; the recording or photo is usually triggered by the movement of animals. Hunters use them to surveil and scout game, but they make great off-grid security cameras as well.

Most game cameras only record videos and/or take photos that are stored on a SIM Card (data storage card). If you want to see the pictures, you have to get to the camera itself and remove the card. In contrast, I like and use game cameras that have the ability to communicate via cell phone towers, thus sending data directly to your computer and/or cell phone. I prefer this to Internet-based cameras (such as webcams) because Internet connections can drop out, and are susceptible to power outages.

The great thing about the game cameras with cellular communications is that you can put them anywhere there is cell phone coverage, which today is fairly wide spread, and they can run on an external power supply or batteries. They are also designed to be unobtrusive and blend into a natural background, making them hard for criminals to spot.

Not only will you get some great photos of the local wildlife but also of any person who trespasses and wanders into the camera's view. This way, if someone breaks into your outbuilding, vehicle, or home, you will hopefully have a nice picture or video of the culprit to show to the police.

I have found these types of game cameras are an excellent solution for off-grid living. They are also durable: one of my cameras is still up and running with full battery reading after two years of



use. I use long-life lithium batteries, which I do recommend, as they last much longer than your standard batteries. Game cameras are a great supplement to, or backup for, a standard video camera system.

## CAMERA TRIANGULATION

Cameras are pretty expensive, and Johnny Dirt Bag loves stealing these bad boys. I have lost count of the people who have told me they have had their game cameras stolen. There are several ways to make sure they stay put, and off of the local pawnshops' shelves (a favorite place for meth heads to sell your goods).

The first one is a basic security method I like to call camera triangulation, which means that all security cameras are pointed at each other from three separate points, creating a triangle. So camera one points at camera two, camera two points at camera three, and camera three points at camera one.

In the middle of this triangle should be the space you primarily want to monitor. By pointing each camera at the other in this type of triangular arrangement, you guarantee that if someone tries to steal one of your cameras, another camera will record the theft. Make sure the cameras are not easily seen, and you will get some great shots of the thief since he thinks he's stealing or taking the only camera . . . not realizing there are others recording his illegal activity.

If you want to be really devious, set up a bait or dummy camera (just a shell; not a functioning camera). Set up the bait in the open so that the thief cannot miss it. It will do one of two things: It will scare off the thief, because he realizes your "private property" signs mean business and you actually do have cameras. Or, the stupid thief will look at it as an item to steal. While Mr. Unmotivated Loser is attempting to take your camera, a hidden, real, functioning camera is pointed directly at the bait camera recording him stealing a worthless piece of plastic.

Most thieves aren't the brightest lights in the bunch, so putting a little thought into your security is worth the time and effort. By doing it right, you will greatly enhance the odds you will not be

a victim, and if you are, you will have a ton of evidence to give to law enforcement. Trust me, in small towns people talk, so if someone gets arrested because of a crime that you recorded on camera using a slick security system, everyone will know you are not to be messed with.

Some other security tips: You can purchase a game camera with a lockbox, which I highly recommend you do. Make sure to purchase one made of steel and not some other flimsy material. Depending on your location, you can also mount it quite high on a tree, so that any would-be camera thief would need a ladder or some serious climbing skills to reach it.

## Dogs

Over my years in law enforcement, the one thing my co-workers and I always dreaded having to deal with when serving search warrants was a dog. There were a few times I thought I was going to have to shoot a suspect's dog because it looked pretty vicious. Luckily, they all ended up being big wimps in the end. Being a dog lover, the last thing I wanted to do was shoot man's best friend. The bottom line is that dogs are a great security system. As a matter of fact, as long as I have owned dogs, I have never had one of my properties broken into.

Remember that thieves are opportunists, so the harder you make it for them to break in, the more likely it is that they will move on to a softer and easier target. Dogs bite and make noise, so most thieves want nothing to do with them.

The catch is that I would recommend a big dog for security purposes. Don't get me wrong, small dogs can be vicious. My mom's little dogs have taken a piece of me on more than one occasion, but they are not very intimidating. When push comes to shove, that little dog will get taken out pretty easily, however, a big dog is a different story. I spent years around K-9 handlers and their dogs, and I will tell you that having those dogs let loose is something that

I wouldn't wish on almost anyone. You aren't getting away, and it is going to leave a serious mark!

Anyone who has been bitten by a large dog knows that they are not to be toyed with. I still have a couple of scars from my youth, put there by dogs that didn't want me in their area. I grew up in the sticks, so more than once I accidentally (okay, maybe purposefully) wandered onto private property and got a nice surprise for my stupidity.

A protective dog doesn't have to be some well-known guard breed like a Doberman or German shepherd. For example, I once had a chocolate Labrador who was a great guard dog (she is now in doggie heaven). Labs are not really known for their viciousness, and they are very loyal and loving dogs, but my lab Brownie (yes I named her) could bark like a doggie cannon. I don't know how many people would not even come to my door to knock because old Brownie was going nuts. Funny thing, she wasn't barking because she wanted to tear them a new one, but because that was her way of saying hurry up, get over here and throw the ball to me.

Like people, dogs have different ways of expressing themselves, but a thief doesn't know what that dog bark means. For most, it isn't worth rolling the dice, plus the house could have an owner who is a staunch believer in the Second Amendment and is now well aware someone is close by.

The best part was that Brownie's buddy was a Rottweiler, but most people never even noticed the friend because Brownie had their full attention.

Ok, now for Gary's disclaimer: I'm not recommending you go and get a dog that is trained to kill or do harm. Many people have been killed in dog attacks that have nothing to do with criminal activity. You also need to be prepared to take on the responsibilities of the particular breed you acquire—some larger and currently trendy dog breeds may make great security deterrents, but have difficult temperaments, high exercise needs, are challenging to train, and can be a very poor choice for inexperienced dog owners.

So I'm just saying that dogs are a great warning to those who may not have the best intentions when coming to your property.

I know I probably didn't have to say all that, but these days, you never know.

## Chapter Summary

No matter how remote your off-grid home will be, you should consider installing a home security system. Your neighbors will know you are coming, even in very rural areas. You should set up your security system at the very beginning of your project, even before work on your house begins.

Reducing easy access to your property should be your first priority. Aim to have two high-quality security points (gates/fences) per access road. Don't cut corners; invest in solid poles and gates that can't be damaged and that create a real deterrent.

Game cameras that communicate via a cell signal are an excellent choice for an off-grid security system. You can triangulate three cameras, or set up a "bait" camera in the open to optimize the chances you will catch thieves in the act. A dog is also a great security deterrent, although a much bigger lifestyle commitment. Above all, remember that it's better to have a reputation as someone who cares about security than to be an easy target in a remote area.

# Conclusion

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## LAUNCHING YOUR OWN OFF-GRID DREAM

Years ago, somewhere between paying my exorbitant mortgage on my massive house in one of the country's most expensive zip codes and driving through appalling traffic and pollution to get to my high-pressure job to pay for it all, I decided there had to be something different. I'm guessing you have come to the same conclusion.

However, turning away from the convenience of public utilities and going off-grid is an undertaking filled with many real-world challenges. It will require you to be innovative and, likely, to learn new skills.

Nevertheless, returning to the true spirit of what America stands for—independence, personal freedom, and making your way in the world through your own efforts—can be one of the most rewarding journeys you will ever make. I've made a lot of mistakes (including hiring the world's worst contractor, that was a big one!), but I've also made a number of strong strides along the way.

Through sharing all the lessons I've learned about selecting, powering, financing, building, and maintaining an off-grid home,

I've also realized some things about how I want to live my life. However, Henry David Thoreau said it all far more eloquently than I ever will in his 1854 memoir and spiritual dissertation, *Walden*. To write this American classic, Thoreau left traditional society to live alone, for two years, in a woodland cabin near Walden Pond in Massachusetts, opting for the mid-19th-century version of off-grid living:

Maybe you are tired of the commute, the cost of living, and the stress of city life. Perhaps Thoreau was tired of his era's version of the rat race, too. He encouraged his reader to aim higher than the values of society, famously writing:

I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived. I did not wish to live what was not life [...] I wanted to live deep and suck out all the marrow of life, [...] and if it proved to be mean, why then to get the whole and genuine meanness of it, and publish its meanness to the world; or if it were sublime, to know it by experience, and be able to give a true account of it in my next excursion.

In this spirit, I feel privileged to have been able to share my "true account" of my own experience in the woods (although my tips are purely practical; I'll leave the more spiritual and literary meditations to a master like Thoreau!)

From the increasing popularity of off-grid living—and indeed from Thoreau's own brilliant words—it's clear people have sought for hundreds of years, in different forms, the benefits of off-grid living: solitude, self-reliance, and simplicity. But will the benefits of living unconventionally outweigh the hassles and the risks? I think so. Thoreau seemed to think so as well, writing in his conclusion:

I learned this, at least, by my experiment; that if one advances confidently in the direction of his dreams, and endeavors to live the life which he has imagined, he will meet with a success unexpected in common hours.

I began this book by noting that going off-grid can mean different things to different people. To you, the reader, I hope the benefits of my endeavors might help you get closer to “success unexpected,” whatever your own off-grid dreams may be.

**Follow the link below to get your free *Going Off the Grid* resources:**

10 Steps for Achieving Your Off-the-Grid Dream

Gary's Best Off-the-Grid Companies and Products List

[www.primalpowermethod.com/offgridresources](http://www.primalpowermethod.com/offgridresources)



## About Gary Collins

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Gary Collins, MS, was raised in the High Desert at the basin of the Sierra Nevada mountain range in a remote part of California. Gary enjoyed his childhood and considers himself lucky to have grown up in a very small town, where he had the opportunity to fish, hunt, and learn about survival in the outdoors from a very young age. He is an active follower and teacher of the self-reliant, survivalist, off-the-grid lifestyle.

A self-declared sports junkie, Gary has been involved in organized sports and fitness for almost four decades, excelling in various organized sports from the age of seven through adulthood. He has a solid background in nutrition and physical conditioning as well. He is extremely passionate about the pursuit of optimal health in mind, body, and soul.

Collins' background is very unique and brings a much-needed perspective to today's fields of health, nutrition, and self-reliance. He holds an AS degree in Exercise Science, a BS in Criminal Justice, and an MS in Forensic Science. After an exciting career in military intelligence Collins worked for the U.S. State Department, the U.S. Department of Health and Human Services, and the U.S. Food and Drug Administration as a Special Agent. His career has taken him around the world and given him a unique perspective on the United States, in fact, the world, is affected by our food, drug, and healthcare policies.

The highlights of his career have seen him protect some of the most powerful people in the world, investigate the biggest tainted pet food death case in the U.S., and unravel certain intricate dealings of one of the largest counterfeit prescription drug rings in the world. He has often said, "If Americans really knew what was

going on in the area of healthcare and nutrition in this country, they would be appalled.”

It can be safely said no one in the health and fitness industry has the inside knowledge and background that Collins has. He is a hybridization of high-intensity health expert, self-sufficiency advocate, and seasoned investigator.

An author and college professor, Mr. Collins advises specialists and is a consultant for high-level organized sports programs and gyms. He is currently an exercise and nutrition consultant for the San Diego City College men’s basketball team, one of the most successful junior college sports programs in California. Some of his other clients include college football players for high-profile programs like Purdue and Kansas State Universities. Collins is also a contributor to the Brink of Freedom online magazine, *Paleo Magazine*, and a member of The Survival Podcast Expert Council.

Collins has two goals: To make living healthy as simple and as enjoyable as possible and to provide people with the truth. In addition to his “Off the Grid Project” and numerous published articles, the Primal Power Method Series (*his total lifestyle reboot*) blows the lid off conventional wellness expectations. He is dedicated to raising awareness and believes his books are essential for every American who is seeking a healthier and simpler lifestyle.

# Resources

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I'm sure I left a couple off this list, but here are the people, companies, and products I found the most reliable and useful during my off-the-grid building experience. I think this is a great list to get started and get going in the right direction without too many wrong turns. My pain is to your benefit; someone has to figure this stuff out, right?!

*\*A lot of these are specific to my area, but I have found that a great number of people looking to live this lifestyle already live in or re-locate to this part of the country. I give no guarantee for their services; they have done a good job for me, and many of them still do work for me today.*

**WWW.ABOVEAVERAGEPLUMBING.COM** (Veteran owned plumbing company that services most of Washington State and Idaho)

**WWW.BACKWOODSSOLAR.COM** (Seller of off-grid power equipment and related products)

**WWW.BACKWOODSHOME.COM** (Magazine for living the self-reliant lifestyle)

**WWW.BERKEYFILTERS.COM** (Maker of table top water purification systems for drinking water)

**BLUEWATER SERVICES** (509) 671-2778 (Specializing in decks and home remodeling in Northeast Washington State)

**WWW.BUSHNELL.COM/WILDLIFE/TRAIL-CAMERAS/TROPHY-CAM/TROPHY-CAM-HD-AGGRESSOR-WIRELESS** (This is the newer version of the wireless security/game camera that I have used with great success for my property)

**WWW.CAMLOCKBOX.COM** (The best lockbox for your security / game cameras)

**WWW.DLWOODWORKS.COM** (Affordable custom cabinets, servicing Washington State, Northern Idaho and Northwest Montana)

**WWW.FASWALL.COM** (High-insulation green building brick)

**WWW.FOGLEPUMP.COM** (Well-drilling services for Northeast Washington State and Northwest Idaho)

**NORTH COUNTY ENTERPRISES** (509) 671-2179 (For all excavation needs for your property. Servicing Northeast Washington State and Northwest Idaho)

**WWW.NORTHERNENERGY.COM** (Providing propane services to residential homes and more remote locations that are difficult to access)

**WWW.THESURVIVALPODCAST.COM** (Daily podcast about all things survival and self-reliance)

**RIVER CITY ELECTRIC, LLC** (509) 671-2276 (Electrician with experience installing solar and off the grid alternative energy systems. Servicing Northeast Washington State and Northwest Idaho)

**WWW.PRIMALPOWERMETHOD.COM** (My website for all things dealing with primal living)

**WWW.YOUTUBE.COM/PRIMALPOWERMETHOD** (My YouTube channel)

**HTTP://WWW.PRIMUSWINDPOWER.COM** (Manufacturer of off-grid wind-power turbines)

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