A REPORT ON EARTHQUAKE PREPAREDNESS FOR PARENTS OF ROSSMAN SCHHOL

This folder is based on a report that was given to Mrs. Betz called, NOTES ON PREPAREDNESS FOR NATURAL AND MAN-MADE DISASTERS WITH EMPHASIS ON EARTHQUAKES FOR ROSSMAN SCHOOL, prepared by Ken Seger with editorial assistance by Patt and Jerry Welk. This report updates the older one and adds information for homeowners and parents.

If you find the information in this file of use to you, would you please send $10 to Rossman School, 12660 Conway Road, St. Louis,MO 63141 with the check made out to Rossman Parents Club. The funds will be used to purchase additional survival equipment for the children.

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PREFACE

When I first started writing this text it began as an 18 KiloByte outline of the steps Rossman School should take to be prepared for an earthquake. This quickly grew to 28K with the addition of more information. Soon a glossary and more additional information was added bringing the total to 58K. Additional activities were added bringing the K up to 70. At that point the entire file was reorganized and an explanation of what the term survivalism

really means was included. Hopefully this trend will continue through the future years as additional information, techniques, supplies, and training are added to improve the disaster preparedness capability of Rossman School.

I would like to thank Patt and Jerry Welk for their encouragement and editing of this text. One of their criticisms was the inclusion of the words survivalist and survivalism. They felt, and rightly so, that the term survivalist has acquired a notorious connotation recently. They suggested that those terms should be replaced with blander, image-neutral terms.

While the negative connotation might be the accepted definition for people who assume that everything they read or hear in the mass media is the absolute truth, a more accurate picture is acquired by those who search for what is true and what is false concerning the survivalist movement.

There are individuals and groups, incorrectly labeled as "survivalist" by the mass media, who are not worthy of the name. These incorrectly labeled people tend to be political or religious extremists who violate the principles of survivalism (see appendix #4) by neither helping others nor advocating freedom. Even though true survivalists outnumber the falsely labeled "survivalists" by over 100 to 1, the true survivalists get less than 5% of any mass media coverage. This merely reflects the mass media's appetite for bad news versus good news.

Since the activities suggested in this text are PRECISELY what true survivalism is all about, the terms survivalist and survivalism have been retained, and rightfully so.

I have been studying the topic of survivalism since 1982. Since 1983, I have been a member of LIVE FREE which is the world's oldest (founded in the early 60's) and largest survivalist organization, been a life member since 1985, been a Live Free Certified Survival Instructor since 1988 and have given lectures on nutrition, nuclear war survival skills, and water purification at various LIVE FREE seminars. I have an extensive library of survivalist literature and subscriptions to all major survivalist newsletters and magazines written in English in the USA, Australia and Europe. I have participated in the various survivalist computer/modem information networks since 1984 and have been the SYStem OPerator and host node of a survivalist BBS since 1986.

Anyone who would care to examine what real survivalists are truly like should refer to appendix #4 for a brief explanation of the topic and sources of additional information from which they can derive their own conclusions.

Ken Seger, March 1990, St. Louis

This text is now over 120K and is a much better training document than the original which was more geared to advocacy and information. I would like to add that I currently teach at the Infinity Self-Reliance Center in Harrisburg, MO. I would hope that anybody reading this document would assume that everything I say is wrong and proceed to go out and try to prove it by studying the topics herein. That way they would learn more about the enclosed information. If anybody can find better products or prices than the ones mentioned here, PLEASE let me know your source if the source is a retail establish that others can patronize.

Ken Seger, Oct. 1990, St. Louis

THE PURPOSE OF THIS TEXT

WHAT THIS TEXT IS FOR

The purpose of these notes is neither to forecast a disaster nor recommend a specific line of action, but to serve as a framework for discussion of the different levels of earthquake hazard, and show the many different methods and levels of preparedness to cope with those hazards.

There is no way to predict, with any degree of confidence, when or how strongly an earthquake will occur. While people such as Dr. Iben Browning have predicted the New Madrid to quake on Dec. 3, 1990 plus or minus 3 days, most other authorities place their predictions in decades rather than in days.

Even in the highly unlikely event that this particular disaster does occur between Oct.31 and Dec. 7th, other types of disasters can certainly occur before and after those days.

If you are moderately prepared for a major earthquake, you are very well prepared for smaller disasters, and at minimum, partially prepared for other larger disasters.

Different levels of problems are identified as ideal, fair, poor, and worst case conditions in the following categories: time of day, time of year, weather, utilities, building damage, support services, level of damage and duration of emergency conditions.

Levels of preparedness are organized around the topics of shelter, lighting, water, food, sanitation, heating and cooling, medical, communication and safety requirements. Each of these topics is covered to illustrate how different levels of preparedness can be obtained.

WHAT THIS TEXT IS NOT FOR

Just because the different categories of problems happen to be lumped into a single problem level does NOT mean that this is likely to be the case in an actual disaster situation. The likelihood of a disaster staying within such nicely defined parameters is practically nil. It is most likely to be a mixed bag of events. In the same vein, the topics in the levels of preparedness are grouped ONLY to show that different levels of preparedness can be sought and they are not meant to be a rigid set of goals. Different levels in different topics will be chosen based on perceived needs and the amount of money and man-hours available for the preparedness project.

THE NATURE OF DECISIONS

If one accepts as true the saying, "The act of not making a decision in itself is a form of making a decision", then one can expand that to, "The act of not even considering a topic at all is itself a form of a decision." If that is the case, then most people have made the decision to be very unprepared for an earthquake or any other major disaster.

Let us look at what that decision entails. People have decided that in a major disaster they will most likely be without safe drinking water, they will only have whatever form of shelter happens to be available at the time,

communications will only be that which is usually available, if intact, there will be no provision for emergency light, bedding or shelter, and that easily corrected hazards will not be eliminated causing great property damage to carpeting, materials, furniture, books, etc.

Now that the topic has been brought up, I hope that the old passive decision will be rejected and replaced with a new actively made and acted upon decision. Hopefully this document will make this change occur sooner than it would have otherwise and long before it is needed.

As one seismologist stated, "You need to choreograph an earthquake well in advance, otherwise you will NOT like the dance."

Another appropriate saying is, "That it is better to be a decade early than a day late."

SO WHAT ARE THE CHANCES OF A QUAKE?

According to a Memphis State University study, the chance of a major earthquake from the New Madrid fault is:

Richter Scale	Probability of occurrence by the year	
	2000	2040
6.7	50%	90%
7.6	10%	25%
8.3	1%	3%

A Southeast Missouri State University at Cape Girardeau study gives the odds as:

Richter Scale	Probability of occurrence by the year	
	2000	2040
6.3	50%	90%
7.6	10%	25%
8.6	1%	3%

Cyclologist Eben Browning is predicting a sightly less than 50% chance of a 7.0+ Richter quake on Dec. 13th 1990 plus or minus 2 days.

But what does that mean? What does the Richter scale indicate?

The Richter scale is a logarithmic scale and refers only to the power of the earthquake and by itself does not predict the level of damage. An earthquake of Richter 8.0 has the same amount of power as 32 - Richter 7.0 quakes or 1,024 - Richter 6.0 quakes or 32,768 - Richter 5.0 quakes. In other words, to dissipate the amount of energy that could be released by one single Richter scale 7.0 earthquake would require a Richter scale 4.0 earthquake to occur every single hour for three years and nine months or a Richter scale 5.0 earthquake to occur every hour for six weeks.

In 1985 Dr. Otto Nuttli, professor of geophysics at St. Louis University, estimated that the New Madrid quakes in the 5 month period of 1811-1812, ranged as high as 8.0 to 8.8 Richter and that 15 to 18 of the aftershocks ranged from 6.5 to 7.0 Richter. Others estimate that 5 of the two dozen or so major quakes were 8.0 or higher. In 1985, the amount of energy stored in the fault was enough to produce an earthquake of 7.6 Richter according to Dr. Nuttli. The last large quake was in 1895 and estimated at 6.0 Richter. It is estimated that a quake of this size should occur about every 80 years. Due to the difference in geology, a quake in the midwest will have a damage area 20 times larger than the same quake would have in California.

It is virtually impossible to predict at what Richter scale a major quake would occur. Even if it were, it would be equally difficult to predict the precise damage level that would occur in the St. Louis area.

Since the Richter scale only tells what the "horsepwer" of a quake is and not what damge the quake generates, a different scale is use to express level of damage. The scale for measuring or predicting damage is the Modified Mercalli Index, which is as follows.

Level 1 - People do not feel any earth movement.

Level 2 - A few people might notice movement.

Level 3 - Many people indoors feel movement. Hanging objcts swing.

Level 4 - Most people indoors feel movement. Dishes, windows, and doors rattle. Walls and frames of structures creak. Liquids in open vessels are

slightly disturbed. Parked cars rock.

Level 5 - Almost everyone feels movement. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some cases. Small objects move or are turned over. Liquids might spill out of open containers.

Level 6 - Everyone feels movements. Poorly built buildings are damaged slightly. Considerable quanities of dishes and glassware, and some windows are broken. People have trouble wallking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is overturned. Small bells in churches, chapels and schools rings.

Level 7 - Damage is slight to moderate in well-built buildings. Numerous windows and some furniture are broken. Considerable damage occurs to concrete irrigation ditches. Weak chimneys break at roof lines. People have difficulty standing. Loose bricks fall from buildings, heavy furniture overturns, many windows break. Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, spires and others. Some sand and gravel stream banks cave in.

Level 8 - Drivers have difficulty steering, towers and chimneys fall, tree branches break and poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Trees shaken strongly with branches and trunks broken off. Slight damage occurs in brick structures built especially to withstand earthquakes. Buildings partially collapse. Stone walls are cracked or broken seriously. Tall structures such a towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells.

Level 9 - Ground is cracked conspicuously. Considerable damage occurs in masonry structures built especially to withstand earthquakes. Some buildings collapse. Underground pipes sometimes broken. Most buildings suffer damage. Houses that are not bolted down move off their foundation. Some buildings collapse and underground pipes sometimes broken. Reservoirs suffer severe

damage.

Level 10 - Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are destroyed, including their foundations. Some bridges are destroyed. Dams are seriously damaged. Large landslides occurs. Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.

Level 11 - Few if any masonry structures remain standing. Large well-built bridges are destroyed. Wood frame structures are severely damaged., especially near the epi-center. Buried pipelines are rendered completely usless. Railroad tracks are badly bent. Water mixed with sand and mud is ejected in large amounts.

Level 12 - Damage is total and nearly all works of constructions are damaged greatly or destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are damned, waterfalls formed and rivers are deflected.

For St. Louis county, the highest Mercalli levels for a given Richter quake in theNew Madrid fualt will be as follows:

6.7 Richter - level 7
7.6 Richter - level 8
8.6 Richter - level 9

Please note that those levels are the highest likely and those damage levels will NOT be uniform throughout the St. Louis area. Some areas will be devastated while others nearby will suffer only minor damage.

It is estimated that a 7.4 Richter scale quake will do approximately six billion dollars in damage in just the state of Missouri.

Even if there is only a 0.1% chance of an earthquake happening, if it happens, it happens. One can not control the likelihood of an earthquake occurring, but one can control the amount of preparedness for an earthquake or other disaster.

WHAT IS THE RANGE OF POSSIBLE CONDITIONS?

When a quake happens, the magnitude of problems will be dependent on the severity of the quake and other circumstances not related to the quake: time of day, time of year, weather conditions and the ability of governmental services and parents to provide assistance.

IDEAL CONDITIONS

Time of day - during the middle of the night when nobody is at school
Time of year - during winter or spring break, summer vacation, or on a weekend when nobody is here!
Weather - mild spring or fall, nice temperatures with no wind
Utilities - no loss of electricity, phone, gas, water, or sewer
Building - a few books and art projects knocked off of the shelves, a few minor cracks in windows or walls
Police/fire/hospital - there and ready, available by phone and everybody in the yellow pages waiting to take your money
Injuries - no people at school equals no injuries
Damage level - no major problems, quake was a small one
Duration - at no time were there emergency conditions

FAIR CONDITIONS

Time of day - before school when just staff and faculty are in or after the PM carpool is over when there are a just a few students and most of the staff and faculty are still here
Time of year - spring or fall during a school day
Weather - spring or fall with rain, or summer or winter with very mild

temperatures and winds and no precipitation

Utilities - no electricity, water pressure low, however, the gas, phone and sewer are working

Building - numerous small cracks in drywall, a few windows shattered, some windows with substantial cracks, many windows with minor cracks, repairs not covered by insurance by Board of Trustee's Discretionary funds

Police/fire/hospital - available but only for critical emergencies, triage is much tighter than usual

Injuries - lots of bruises and scrapes, some minor cuts, just a few significant injuries such as major cuts, sprained or strained joints or broken bones

Damage level - the quake was significant, and some aftershocks are expected

Duration - most students are picked up before sundown with just a few being picked up the next day, utilities return to normal in a day or so

POOR CONDITIONS

Time of day - around AM or PM carpool when there are many parents at school available to help

Time of year - a hot summer or a cold winter school day

Weather - summer with rain and wind or winter with snow and wind

Utilities - only the phone is working, and it is overloaded with long delays for connections

Bbuilding - significant damage, most windows broken or cracked, some deformation at a few door frames, repairable, but expensive, a loan is needed to cover repairs and expenses until lawsuit with insurance company is resolved

Police/fire/hospital - difficult to get to or contact, services are very overburdened

Injuries - numerous minor cuts, abrasions and bumps, several significant injuries and one life threatening injury such as sucking chest wound, severe bleeding, shock, etc.

Damage level - major quake, aftershocks are numerous but smaller

Duration - moderate number of students have been picked up by 9PM but the balance are not picked up until noon of the next day with a few distant students not picked up for another day or so

WORST CASE POSSIBLE SCENARIO

Time of day - between 9AM and 2AM when there are the fewest number of parents available for assistance

Time of year - either the heat of summer or the cold of winter

Weather - summer/no clouds, high heat, drying winds or winter/clouds, 35-40 degrees with rain

Utilities - none except gas (leaking), no water, electricity or phone

Building - Profound damage to older building. Due to the collapse of pantry wall, the gas shut-off valve is inaccessible with strong smell of gas around valve. Gym & the new wing have damage of brickwork and deformation at corners. Both are suitable for shelter with some risk, however children are afraid to enter. Older building may not be financially worth fixing. Insurance company files for Chapter 11 bankruptcy.

Police/fire/hospital - No phones to call for assistance, besides all services

hopelessly swamped with other demands. Conway road hopelessly clogged due to cracked pavement and people trying to get to St.John's & St.Luke's

Injuries - bleeding major and minor, sucking chest wounds, eye injuries, broken arms, legs of students, faculty and staff. Some cases of hysteria, panic and catatonia of students, faculty and staff.

Damage level - high!, 8+ Richter as in the early 1810's

Duration - majority of parents unable to retrieve children until next day with several faculty, staff and students who live farther out unable to go home for a few days, electricity and phone will be out for at least week

PLEASE NOTE: Estimations of damages in all cases are HIGHLY speculative. Actual damage to building is dependent on quality of land or landfill under the building and underlying rock formations on which the preparer has no meaningful data. Also the degree of resistance of buildings to seismic shock is unknown to the preparer of this report.

TRAINING OPTIONS

FACULTY AND STAFF

Minimum - Review "duck and cover" techniques, review evacuation drills and check that all Red Cross First Aid and CPR cards are current.

Good - Above plus retake standard classes

Better - Above plus see if 50 hour Red Cross course could be arranged, view Practical Preparedness video and listen to the, What you Should Know About Earthquakes, audiotape.

Best - Over the summer loan VCR (if needed) and view Nuclear War Survival Skills video tapes 1-4 and Soviet Civil Defense video tapes 1-7. See appendix #1

STUDENTS

Minimum - Incorporate "duck and cover" earthquake safety routines into the fire/evacuation drill

Good - Talk about earthquakes and how they are rare, with effects usually limited to minor building damage

Better - Tell about Rossman's preparations as is appropriate to age. Talk about what you would do if you didn't have utilities for an hour or a day etc.

Best - Practice skills in a drill, perhaps as an after school activity. Have the children talk to Rowan-Woods students about their experiance of going to school without having running water.

PARENTS

Minimum - Give all parents a sheet explaining what preparedness steps Rossman School has taken.

Good - Offer general preparedness information to all parents interested.

Better - Offer a special meeting in which preparations are discussed and demonstrated. Offer more detailed preparedness information.

Best - Form a Parent's Preparedness Club in which members can learn in more detail about preparedness. Develop a Parent Volunteer list for communications, assistance and housing of remote students, faculty and staff during a disruption of normal transportation facilities.

EQUIPMENT NEEDS

Equipment is needed to fulfill the basic human needs of shelter, water, food, sanitation, heating or cooling and medical needs. The secondary needs of light and safety are important for the well being of the children as well.

SHELTER

Shelter is needed to protect the children, faculty and staff from hypothermia, hyperthermia, rain, snow and wind. While high quality shelter would be preferred, it should be remembered that the scope of this preparedness plan only covers keeping the children from harm until their parents can take over the children's needs.

WATER

Water that is both potable and palatable is needed for drinking, sanitation, and possible food preparation.

FOOD

Food is needed for psychological aid more than physiological need if the duration is a few hours. It is highly useful for group activity, a sense of

normalcy, comfort, etc.

SANITATION

"When ya gotta go, ya gotta go!" There will be enough stress in an emergency without forcing the kids to use a trench toilet. Also, a emergency toilet will help speed cleanup after the disaster.

HEATING AND COOLING

This demand will be minimal if reasonable shelter is provided. Cold and hot packs might be needed in special cases for medical purposes.

MEDICAL

At least the basics are needed. A higher level of preparedness in this topic allows greater safety.

COMMUNICATIONS

At least inward communications should be available to listen to AM and FM radio. If units with an outward ability are purchased, SSB CBs would be the minimum. Mobile and portable phones might be utilitized, if still functioning.

LIGHTING

Illumination is needed for group activities, private activities, a sense of security, special cases, etc.

SAFETY

Since Rossman is located in a low density, upper income area, this need is unlikely. However, protection from rodents, dogs, other animals and humans may always be a possibility.

LEVELS OF PREPAREDNESS

EASIEST PREPARATIONS ARE NO PREPARATIONS, BUT ALSO THE WORST

CURRENT LEVEL OF PREPAREDNESS

Shelter - What is on everybody's back
Light - Each earthquake kit has two plastic flashlights and spare batteries
Water - How much do the water heaters hold?
Food - What is in the kitchen on average or lowest point?
Sanitation - Those two large bushes in the woods over there and hopefully a shovel.
Heat/cooling - hmmmmm.....
Medical - First aid kits, oxygen system, splints, venom extractors, Epi-pen, the medical supplies in the earthquake kits and whatever is in the faculty and staff's cars.
Communication - clock radios, hope the phones still work, two three channel standard CB's used for car pool with all three channels hopelessly clogged by more powerful transmitters; therefore, if no phones, communication with outside world consist of the gym teachers transporting slips of paper.
Safety - There are trees from which switches can be cut.

SHOE STRING, MAKE DO JURY RIGGED

Shelter - A few rolls of 5 mil plastic and some rope (in the science room) are

a lot better than nothing for expedient tents.

Light - A battery operated fluorescent light as an area light

Water - a crystalline iodine "generator", a 5 gallon jug with tap and a container of paper cups would help

Food - a 5 pound bag of hard candy is cheap and will last for years

Sanitation - for $10, two box style portapotties can be purchased via mail order

Heat/cooling - a few instant cold packs and hot packs for the first aid kit would be nice

Medical - additional supplies for acute injuries

Communication - at least one AM/FM radio with batteries to match, again the batteries need to be rotated

Safety - mace, tear gas, cap-stun or other sprays are fairly effective

MINIMAL BUDGET

Shelter - a few large good tarps with ropes and tent spikes would be better

than plastic

Light - Another battery operated fluorescent light plus 6 cyalumes

Water - a few iodine purifiers with 25 gallons of water store at all times in various locations would be nice and cost only $30

Food - Purchasing some foods that require no water or heat (if you don't mind eating cold chicken with gravy, etc.)

Sanitation - The box style portapotties again but with the addition of a portable sink (5 gal.)

Heat/cooling - quite a few heat and cold packs + some aluminized mylar sheets (the so-called "space-blankets")

Medical - a second major kit can be added to be stored outside the building

Communication - one radio for scanning AM and another for FM, 20 year storage D cells

Safety - a higher grade of anti-personnel incapacitating gas

MODERATE BUDGET

Shelter - a tent that would house two dozen children or any injured can be purchased for $300

Light - numerous plastic flashlights with 20 yr. D cells, several fluorescent lights with 20 year D cells, several cyalume sticks of various types

Water - Several iodine purifiers, with filter papers and activated charcoal to improve palatability, some "Tang" or "Wylers" would be nice and multiple stored water mylar/boxes in several locations

Food - a large meal in an MRE can be had for about $3.50 and will store for years, a cheaper method would be to purchase MRE components

Sanitation - 3 box style portapotties, 2 - 5 gallon portable sinks and a "solar" shower for cleaning spills and accidents

Heat/cooling - heat and cold packs, numerous space-blankets plus numerous "space" sleeping bags

Medical - medical kit should contain all possible supplies that faculty and staff are qualified to use

Communication - 1 AM, 1 FM, 1 TV band radio with 20 yr D cells

Safety - a flare gun for signaling, or in a worst case scenario, defense

WELL BUDGETED, CONVENTIONAL

Shelter - an army surplus 16' x 32' tent can be booought for $500
Light - numerous Mag-lite flashlights with 20 year storage batteries, fluorescent lanterns with 20 yr. batteries, cyalume sticks - several bright white 30 minute units for special applications and various colored 12 hour units for night identification of people and objects
Water - Water storage as above with Katadyn microfiltration purifier and activated charcoal filters
Food - 1 or 2 MREs for everybody, + additional foods for special requirements
Sanitation - 2 or 3 plastic hassock style portapotties, 3 - 5 gal. portable sinks, 2 "solar" showers
Heat/cooling - all of the above with a small stove or immersion heater for heating water. A kerosene lamp can also be used to heat water.
Medical - all medical supplies to cover a large number of minor problems, plus a kit that would be useful for a General Practitioner M.D.
Communication - 1 AM, 1 FM, 1 TV band, 1 - 40 channel SSB CB
Safety - sidearm locked in "gunsafe" with safety bullets ASSUMING several of the faculty and staff are trained to use it in a proper safe and legal manner.

VERY WELL BUDGETED, U.S.A. STYLE SURVIVALIST'S PREPARATIONS

Shelter - Standard "Fighting Chance" style blast/fallout/bio-chem war shelter consisting of below ground cylindrical steel tank outfitted with hammocks for all occupants and air blowers with purifiers.
Light - Protected deep-discharge battery operated fluorescent lights for the shelter, with portable fluorescents and Mag-Lite with 20 year cells

Water - Shelter would be equipped with a well for cooling, sanitation and drinking.

Food - For short-term, MREs, MR8s and freeze dried. For long term year-long, Morman 4, Kearney Diet or Morman 4 + 40.

Sanitation - Each shelter equipped with chemical toilet and pump to a holding tank buried outside shelter.

Heat/cooling - The shelter air and water systems can control any heating or cooling needs.

Medical - as above plus a kit that would be useful for the highest qualified M.D./parent in their various fields of medicine.

Communication - as above plus protected from lightning and EMP with antennas for maximum range and clarity, plus phones between shelters

Safety - sidearm with shotshells for rodents, snakes and other short range (5 to 20 feet) problems plus a longarm for dogs, skunks and other problems which need to be removed at a longer range (20 - 100 feet). Both properly stored in a locked safe with safety ammunition.

FIRST CLASS PREPAREDNESS, TYPICAL SWISS GRADE SCHOOL

Shelter - Standard Swiss below ground blast/fallout/chem-biowar shelter consisting of below ground reinforced concrete rooms with bunks for all occupants with wartime air handling system. See appendix #2 for details. As an alternative, the Oak Ridge National Laboratory's 3,400 SQ. FT. Blast-upgradable Hazard-resistant Earth Sheltered Residence could be easily modified for a totally underground use at a savings of 20%.

Light - protected fluorescent lights run from generator or deep discharge batteries plus all of the above portable lights

Water - A well as per Technical Directive 1966 2-7 which can provide 100 grams water per hour per shelter space.

Food - Nestles Corp. Uberlebens Nahrung (survival rations)

Sanitation - A well and a septic system

Heat/cooling - standard Swiss blowers and filters for dust, radioactivity, chemical and biological warfare air-bornes, blankets on all of the bunks

Medical - Standard "First Aid Post" (also known as a Protected Practice) with 32 beds for triage and first aid with supplies, or "First Aid Station" with 120 to 140 beds or bunks with an operating table for triage, first aid, and final treatment of lightly wounded patients

Communication - EMP hardened radios, separate units for AM, FM, TV, Emergency channels, SSB CB, HAM and shortwave

Safety - "All facilities can operate for several days independent from the outer world." - OUR CIVIL DEFENSE p.16, plus a standard soldier's kit of full-auto military rifle, helmet, backpack, etc. for all males. See Appendix #2 for additional information.

ADDITIONAL ITEMS FOR PREPAREDNESS - Detached building for supplies, chainsaw, kerosene lights and perhaps a heater, military ammo boxes, PVC tubes or used Coke syrup barrels for storing supplies .

WELL THAT'S REAL NICE.....HOW MUCH?!?

These prices should be considered low estimates as shipping will have to be added to items not available locally. See appendix #3 for details.

CURRENT LEVEL OF PREPAREDNESS

Shelter - $0.00
Light - 0.00
Water - 0.00
Food - 0.00
Sanitation - 0.00
Heat/cooling - 0.00

Medical - 0.00
Communication - 0.00
Safety - 0.00

TOTAL $0.00 PER PUPIL WORTH $0.00

Remember: You get what you pay for! TANSTAAFL

SHOE-STRING, MAKE DO, JURY RIGGED

Shelter - $20 some plastic sheeting and rope
Light - $30 one battery operated fluorescent light with spare batteries
Water - $20 1 iodine purifier, 2 - 5 gallon containers
Food - $5 a bag of hard candy
Sani. - $10 2 box style toilets with paper
Heat/cool - $10 2 heat packs, 3 cold packs
Medical -$100 neck braces, etc.
Communi. - $10 portable AM/FM with alkaline batteries
Safety - $30 3 small units of Cap-Stun for $30 or
in bulk for 26 various sizes for $144

TOTAL $235 PER PUPIL WORTH $1.21

MINIMAL BUDGET

Shelter - $120 tarps instead of plastic sheeting
Light - $72 two battery operated fluorescent light plus 6 cyalumes
Water - $40 more water storage
Food - $120 a bigger bag of candy and 24 MREs
Sani. - $70 5 box toilets and paper, 1 solar sink & soap

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Heat/cool -  $92  cold & heat packs,10 each, 24 space blankets
Medical   - $200  various
Communi.  - $104  another radio and better batteries
Safety    - $144  26 units purchased wholesale

      TOTAL $962       PER PUPIL WORTH  $4.93
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MODERATE BUDGET

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Shelter  - $300  used army tent with poles and stakes
Light    - $550  33 good FL's,4 fluor.,20 yr cells & 12 cyalumes
Water    - $110  more purifiers & storage, acti. charcoal filter
Food     - #350  100 MREs
Sani.    -  $92  3 box toilets, 2 sinks, 1 shower
Heat/cool- $364  20 each cold & heat packs, 36 blankets & 24 bags
Medical  - $400  various
Communi. - $156  another radio for the audio portion of TV VHF
Safety   - $268  26 Cap-Stuns + a signal flare gun with 4 flares

 TOTAL   $2,590       PER PUPIL WORTH  $13.29
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WELL BUDGETED

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Shelter  - $500  a used military tent
Light    - $826  as above plus 12 Mag-Lites and 24 cyalumes
Water    - $300  as above plus microfiltration unit
Food      - $800  250 MREs plus a few freeze dried meals
Sani.    - $424  3 toilets, 3 sinks,2 showers, 10-5 gal bags
Heat/cool- $425  above + kerosene lantern or immersion heater
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Medical  -$1000  various
Communi. - $350  as above plus one 40 chan. SSB CB
Safety   - $600  as above plus a sidearm with gunsafe

 TOTAL   $5,225       PER PUPIL WORTH  $26.80


VERY WELL BUDGETED, USA SURVIVALIST STYLE
                        (see EQUIPMENT OPTIONS for details)
Shelter   - $75,000
Light      -  $1,500
Water      -  $2,000
Food       - $10,000  3,500 MREs, OR 1 year of Morman 4 $62,500
Sani.     -  $3,000
Heat/cool -  $5,000
Medical   -  $5,000
Communi.  -  $3,000   as above plus EMP protectors, ant.& tower
Safety     -  $1,500   as above plus longarm and safe for longarm

  TOTAL    $106,000        PER PUPIL WORTH  $543.59


FIRST CLASS PREPAREDNESS
               (see EQUIPMENT OPTIONS & Appendix #2 for details)
Shelter   -$200,000
Light      -  $5,000
Water      -  $4,000
Food       - $80,000  1 yr. of Kearney diet + freeze dried foods
Sani.     -  $6,000
Heat/cool - $10,000
Medical   - $20,000  this estimate is probably way too low
Communi.  -  $7,000
Safety     -  $5,000
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TOTAL $337,000 PER PUPIL WORTH $1,728.21

PERSONAL PREPAREDNESS PACK FOR THE 33 FACULTY AND STAFF

If the staff and faculty are expected to care for our children during the first phase of an emergency, we parents should, at least, provide materials for the care of the faculty and staff.

In order for normal school functions to resume as soon as possible, it is in our best interests to minimize the effects of an emergency on the home lives of the faculty and staff. It is fairly unlikely that staff and faculty members are personally prepared for a major quake. It would be advantageous to develop emergency packs for them. Stored at the school, these packs would be taken by the faculty and staff when they return home.

For faculty and staff who live far away, volunteer parents should arrange temporary housing until normal transportation becomes available.

The following would be in the pack the 33 faculty and staff would carry home with them.

They represent a strictly MINIMUM kit to be upgraded and expanded as time and funds permit. A few upgrade items are listed in ().

Crystalline iodine water purification kit
Trash sack for expedient poncho (heavy duty military poncho)
Trash sack to carry all items in (backpack - medium ALICE, no frame)
How to live without utilities book NUCLEAR WAR SURVIVAL SKILLS
Aluminized mylar sleeping bag
Aluminized mylar 5 gallon water container
Box/bag/disinfectant for expedient toilet
Zip-lock bag, large for large items
Zip-lock bag, small for small items
1 MRE (2, 3 or more)
Flashlight with batteries & spare bulb (Mag-lite with 20 year cells)
Matches, water resistant (lifeboat matches)

Candle
Trioxane cooking fuel tabs

For a minimal kit TOTAL $1,980 $60 per kit

For partially upgraded kit TOTAL $3,894 $118 per kit

For a more thorough look at emergency kits, review the various kits available from Preparedness Products Inc. and The Emergency Lifeline Inc. Also, various survivalist recommended backpacks lists and lists of home survival suppllies are available from Ken Seger.

Note; Much of this has been done or is being done at Rossman as of 9/90. This topic is left in this report as a guide to the homeowner.

RETROFITTING THE EXISTING BUILDINGS

RETROFITTING THE BUILDING'S CONTENTS

Many small modifications can be made that will reduce injury and property loss for a small expenditure of time and material. The best way to accomplish minor retrofits would be to examine all rooms, hallways, closets and storage areas and consider what would happen if there was a sudden horizontal or vertical acceleration.

For each area an inventory sheet should be made with two main categories: physical injury and property loss. Each of these categories having a major threat and minor threat division. For example, under major injury: the need to secure tall, top-heavy bookcases, filing cabinets that could cause injury on impact, or water heaters, kilns or kitchen equipment that could generate a fire or explosion. Under minor threat: the need to secure frames that have glass or computer printers. Under major property: the need to secure computer equipment, copiers, video equipment, heating and cooling devices, etc. Under minor property: the need to secure records, and other breakables.

While the mainence man most certainly has the ability to effect these improvements, having the time to implement them, in addition to normal services within normal working hours, is unlikely. His terms of employment could be expanded if he is willing and finances are available, or a task force

of moms and dads handy with tools could come in on scheduled weekends.

RETROFITTING THE BUILDINGS THEMSELVES

Both the necessity and the feasibility of major retrofits on the structures need to be studied by a qualified engineer or architect. Carmen Johnson has lists of publications that might aid this activity. If one of the Rossman parents is qualified for this activity, and is willing to waive their fee, the school should purchase any needed materials and reimburse expenses.

RECOMMENDATIONS

If Rossman parents, faculty and staff were typical people, the results of viewing this information would be, "Yup that's a good idea. Somebody should do some of that stuff sometime.", and that would be the end of it. We would continue at our current state of preparedness which is better than most schools but still has room for improvement.

Rossman people are not typical people. Otherwise, Rossman would not be the unique quality institution that it is.

I am certain that all of us would like to see the children of Rossman have the same chance of surviving an emergency that a Swiss child has. Unfortunately our society does not place as great an emphasis on safety as the Swiss do. If we did, this report would be unnecessary.

Unlike the Swiss, we can not expect funding from either the Federal, State, county or city government. Like everything else at Rossman, if we want it done, we need to do it ourselves.

While manhours and funds have been made available for preparedness, this amount was not unlimited. Therefore, this past summer, time and money went into items that will make the greatest amount of difference. This effort was the earthquake kits which improved our medical preparedness and light sources. While this vastly improves our preparedness over what it was at the beginning of 1990, we still have room for improvement.

While food and shelter are quite important, a child can die from a sucking chest wound or cut blood vessel much faster than they can from hypothermia or starvation. After the possible critical injury needs have been prepared for, attention should be paid to items that can afford the greatest amount of safety for the least amount of time and money. This would be shelter from the elements.

After this need has been at least minimally prepared for, the remaining topics can be covered as time and money permit. Please note that much of the equipment can provide great utility at very low cost. Example, significantly improved lighting will cost over $100, whereas sanitation requirements for human waste can be dealt with for less than $30.

A wildcard that can frustrate preparedness planning is the arrival of additional people not considered part of the original plan. This problem has two aspects. First, while it is hoped "more hands make lighter work", those hands are attached to a body that needs food, water, sanitation, shelter, and perhaps, medical attention. Second, the additional individuals will not have taken part in the preparedness training. This places an added burden on managers to maintain control and perform expedient training during the emergency.

Since the individuals are outside of the system, their sense of willingness and ability to follow orders may be less than ideal if not

outright disruptive. Care should be taken not to offend others who desire shelter as they may be ideal candidates for various tasks that one does not want to employ the trained staff and faculty on, such as, menial tasks, scouting, heavy labor, etc.

The illustrated degrees of preparedness, are meant to demonstrate the different levels of preparedness available. Sticking to one level on all topics cannot be assumed to be the most effective use of money. Depending on varying opinions as to the degree of need in each area, different topics can be prepared for at different levels.

As stated in the overview, these notes are merely a framework for discussion. Cost estimates of different levels should be used like a menu for a 7 person dinner at a Chinese restaurant. Choose one appetizer, one soup, several entrees and one dessert. The mix of preparedness levels will be determined by the perceived degree of need.

SUGGESTED ACTIONS TO BE TAKEN

ADDITIONAL INFORMATION FOLDERS

Ultimately, there are two sets of information folders that may need to be created for the preparedness plan. One set for information before a disaster and another for use during the disaster.

Preparing for disaster: This set of folders should contain informational checklists to help various people and groups prepare to mitigate the effects of a disaster. Obvious targets would be the various task force members, faculty and staff and parents who wish to enhance their home preparedness level. Each folder should include a bibliography of additional information resources.

Executing preparedness plans: During a disaster, everybody's adrenaline is up and people who could recite their disaster plans backward and forward on a typical day are incapable of remembering the priorities of their own plan

under the extremely stressful circumstances. Instead of a bulky folder that might be misplaced or not carried along due to its size, a laminated 3"x5" or larger card with the essentials printed on both sides might be very helpful. This could be put in a glove compartment, taped to the CB, etc.

A similar card, stating in simple terms how to use the supplies, should be included in the preparedness supplies.

While it is tempting to use 8 point or smaller type face and make the card an encyclopedic warehouse of information, it should be remembered that the card is not intended to be used under ideal conditions, but under the worst possible conditions where lost or broken eyeglasses or with a flashlight whose batteries should have been replaced many months ago might be the case.

TASK FORCES

Since Parent's Club meetings already have a full agenda, a separate evening meeting of parents who wish to become involved in school disaster preparedness would probably be best. Those parents who choose to come should be given this folder several days before the meeting so topics can be covered more fully.

One of the more important aspects of that, and subsequent, preparedness meetings, would be the creation and activation of various parent task forces. These task forces would carry out the needed activities to implement whatever level of preparedness is desired. Below is a list of some of the possible task forces.

PURCHASING AGENTS - Most of the prices of preparedness items are listed at retail. Very little price reduction can be effected on items purchased in small quantities. However, on items purchased in quantities of one-half or one full gross, a sizable discount might be available if purchased directly.

CB NETWORK - If the school purchases a 40 chan. SSB CB, it would be helpful to have a network of parents who have similar equipment. Ideally each node of the network would be located a significant distance from each other throughout the area of parents homes so that each Rossman parent would know whom they could go to for communication with the school. A primary, secondary and

tertiary channel should be for school to parent communication. Another set of channels should be established for parent to parent communication. This might be especially needed if certain nodes have difficulty communicating directly with the school. The same type of network can be used if people choose to go the HAM radio route of 2, 5 or 10 meter equipment.

PORTABLE PHONE NETWORK- While the CB network would be totally independent of utilities, there is a possibility that car and handheld phone service might either be uneffected or the first to be repaired. This network would not be as independent as the CB network, but if it is available it would be of great benifit.

KIT MAKERS - These people will create and assemble the various kits.

TEMPORARY HOUSING - These would be volunteers who would agree to house students, faculty, and staff who have difficulty getting home after most others have left. These might be considered way stations for traveling home. These volunteers should have stored bedding, water, food, sanitation and shelter for the number of people they choose to house.

4WD OWNERS - Since transportaion might be quite a problem if the quake is large enough, a volunteer group of owners of 4 wheel drive vehicles with adequate ground clearance should arrange an expanded carpool based on the capability of their vehicle. One possibility would be a shuttle service from school to the way station houses to reduce the distance parents without 4WD would have to go to pick up their children should transportation be limited to 4WD in certain areas. Establishing this emergency carpool would also be a good idea if there were ever a blizzard-like storm in which 2WD travel becomes difficult.

FINANCING PREPAREDNESS

It should be very clearly stressed that financing for preparedness be above and beyond normal school finances. It simply won't work for a parent to say, "Well, this year I'll give to the preparedness fund instead of annual giving." This will not work. Annual giving supports the day to day operation of the school. The endowment giving is strictly for the endowment fund. Any donations to the preparedness fund needs to be above and beyond normal giving patterns least the rest of the school functions suffer.

The funds for preparedness should be considered similar to a single premium insurance policy. Funds to purchase an item that will need to be replaced in five years are similar to a single premium 5 year term non-renewable policy. Funds for an item that will last for decades would be like a single premium paid life policy.

A PREPAREDNESS PLAN IS INSURANCE. If you are fortunate enough not to have cause to use it, it was an unnecessary purchase. But it is too late to purchase it after the need arises. What you purchase is piece of mind. By having a preparedness plan implemented, each parent knows they have fulfilled their moral obligation to care for their child to the best of their ability.

CLOSING COMMENTS

This paper can not possibly convey all of the information needed to create a preparedness system. There are many fine texts available from various sources that the serious student of preparedness should study. Demonstrations of survival products are available from Ken Seger by appointment.

Ken Seger does not sell or have any economic interest in any sales of survival supplies. While Ken Seger is a Certified Survival Instructor for LIVE FREE and an instructor at INFINITY SELF-RELIANCE CENTER, the material presented here, or in any demonstrations, are strictly Ken Seger's personal viewpoints and opinions and do not necessarily represent the opinion of LIVE FREE or ISC.

Ken Seger can be contacted at 763 Haw Thicket Lane, Des Peres,Mo 63131 or (314)821-9147 (voice line) or Ken's Survivalists' BBS 821-2815 (data line 3/12/2400 bps).

Preparedness planning necessitates working around a big "Catch 22". If the quake is small, the extensive preparations are not needed. Utilities are all intact, police, EMTs, hospitals, ambulances and other emergency services are all there, but not needed. If the quake is large, no amount of preparedness planning will be able to solve every single problem. Utilities, police, EMTs, hospitals, ambulances and other emergency services will all be desperately needed, but unavailable.

Planning for the worst case, can lead to, what may be considered, "overdoing it". If all disasters occurred under ideal conditions, preparedness planning, and the attendant expenses, would be greatly reduced. Real life situations rarely have easy answers.

APPENDIX #1

ON THE TOPIC OF NUCLEAR WAR

Why should books and videos on the subject of nuclear war be included here?

1) A confidence building mechanism. If a person acquires the knowledge and skills to survive a full scale nuclear war, they then know that surviving a much smaller catastrophe like a major earthquake is certainly within their capabilities.

2) It focuses the mind on what is and (perhaps more importantly) what is not needed for survival.

3) To put our activities in perspective. 1/4th of the world's population has effective Civil Defense (the U.S. does not). There do exist other cultures that are willing to dedicate more manpower and money to protecting their children than we do at present. When comparing their preparations to the ones that we are considering, our efforts are not that expensive or extensive.

4) A realization that the topic of emergency preparedness, if it is to cover one situation in a thorough manner, must cover all aspects of emergencies. To a large extent the techniques and research that are helpful to earthquake preparedness stem from developing the technology and skills to survive a nuclear war. It is useful to know how a techinique evolved, rather than to simply know the answer.

5) Thinking about a nuclear war is an excellent method of making a checklist of needed skills and materials for other disasters. By comparing the needs of surviving a nuclear war with the needs of a lesser emergency you can make more effective use of time and material. There are many survivalists who have absolutely no expectation of a nuclear war; however, they prepare for one as a method of preparing for future emergencies they do expect to occur. If you are prepared for a nuclear war, you are prepared for anything else that might happen.

6) If the estimates by the CIA do come true, and there are 20 nations in the year 2000 that will have InterContinental Ballistic Missiles (in comparison to the current 5), then this small, limited introduction will be of assistance to any additional steps of preparedness that may be chosen in the future.

APPENDIX #2

ADDITIONAL NOTES ON SWISS SHELTERS

The Swiss have the best all-hazards preparedness system in the world, followed closely by the Scandinavian countries, USSR, Red China, and Israel.

Below are some specification extracted verbatim from Federal Swiss law.

The shelter shall not exceed 5% of total building cost, excluding the purchase of ground (as per Swiss Federal Law BUILDING MEASURES FOR CIVIL DEFENSE dated 4 October, 1963 Article 8 - 1) with the Federal government providing 30-70% costs of building and equipment (same law Article 5 - 1) with canton (state) and community (city) assuming the remaining costs (same law Article 6-1). Shelter spaces shall be 2/3rds the number of seats in school

as per Swiss Federal Department of Justice and Police, Office of Civil Defense - Technical Directive for the Construction of Private Air Raid Shelters 15 November 1966 Chapter 2.1.1.2 - upgraded to one space per person as per Report of the Federal Council to Parliament on the 1971 Conception of Civil Defense 11 August, 1971 Chapter 4.3.4 with one fully protected space for each member of the nation by 1985/1990. As per Technical Directives etc. 1966 there shall be per shelter space - from 2.1.1.3 - 10.8 sq ft floor space, 88 cu ft volume, 10.8 sq ft per ventilator, 0.54 sq ft floor space for air lock, 0.76 sq ft for decontamination room - from 2.1.1.1.2 the shelter shall be divided into gas tight cells each containing a maximum of 50 people with a total capacity of 200 persons. Several shelter groups may be situated next to or on top of each other if decentralization is not possible - from 2.2.2.3 if shelter has 101-200 spaces separate decontamination and air rooms are mandatory - from 2.2.3.1 for 101-200 place there shall be at minimum 1 category I escapeway, 1 or 2 (depending on cell configuration) category II escapeshaft(s) and 1 category IV escapetube with all entrances, exits and ventilation openings able to withstand 1 ATM <or 3 ATM> ie. a Hiroshima level of blast (12KiloTon) at 0.4 mile <0.2 miles>, a 100 KiloTon blast at 0.8 miles <0.4 miles>, a 1 MegaTon blast at 1.6 miles <0.9 miles> or 10 MegaTon blast at 1.6 miles <0.9 miles>.

In addition to the shelters proper that are also underground duplicates of government offices, underground protected storage of emergency equipment, and duplication of medical facilities in blast/fallout/biochem special shelters. For every 5,000 Swiss there is one First Aid Post which represents a protected practice and normally has 32 beds for triage and first aid. For every 18,000 Swiss there is one First Aid Stationof 120 to 140 beds for triage, first aid and final treatment of lightly wounded patients with one operating table. For every 38,000 Swiss there is one Emergency Hospital/protected Operating room. The protected operating room is located under a hospital and has about 250 beds and represents a basic hospital. An underground emergency hospital is built where no peacetime hospital exists for final treatment of wounded patients.

All laws and technical construction notes are available from the Federal Office for Civil Defense, WRITTEN IN ENGLISH, in Berne, Switzerland.

The inclusion of the above information is to put a small earthquake

preparedness plan into perspective as far as what can and what can not be done.

Please note that the Swiss system is NOT just a theoretical abstraction of what should be done. There are fallout shelters for over 115% of the Swiss population and fallout/blast/biochem shelters for 90+% of the Swiss population installed and operational as of 1988.

APPENDIX #3

PRICES OF PREPAREDNESS SUPPLIES

(Please note; some of these prices might be out of date)

40 channel SSB CB - $160 with antenna and battery pack, Santa Fe Distributing, 14400 West 97th Terrace, Lenexa,KS 66215 orders only 1-800-255-6595

45 ACP revolver & shotshells - used $150, refurbished $200, new $300

Activated charcoal filter - depends on size and packaging $30-60, from SI

Aluminized mylar blanket - Ie."space blanket" $3 from Cabela's, 812-13th Ave., Sidney,NE 69160 orders only 1-800-237-4444

Aluminized mylar sleeping bag - Ie. "space" bag $9 Cabela's

AM/FM radio - small unit that runs on AA or C cells $5-10 any discount store larger units that run on D cells have better sound since they have considerably larger loudspeakers, $40

AM/FM radio, solar/generator/AA powered - $35 from Preparedness Products

AM/FM/TV radio - as above with TV audio band $20-30

Ammo cans, military - smalls $3-10, larges $15-50, many stores

Audiotape, How to Survive a Major Earthquake, 32 min. $5.00 The Emergency

Lifeline,1514 E. Edinger, Suite 1, Santa Ana,CA 92705 (714)558-8940

Book, Emergency/survival Handbook by the American Outdoor Safety League, $3.45 from Preparedness Products, 3855 South 500 West, Bldg. G, Salt Lake City,UT 84115 (801)261-8823

Book, The Preparedness Handbook $2.40 from Preparedness Products

Book, Reader's Digest First Aid Book $1.25 from Prepared. Prod.

Book, Earthquake Preparedness $4.00 from The Emergency Lifeline

Brinkman (imitation Mag-Lite) (3 D cells) Wal-Mart $18 simialr to Nu-Light

Cap-stun - $10-25 in 5 different sizes, Phoenix Systems Inc P.O. Box 3339, Evergreen,CO 80439 for individual sales, Guardian Security Products Dept.SH-3 8350 North 7th Street, Phoenix,AZ 85020 for $144 26 unit package

Cyalume sticks - 12 hour 10/$10 from Sierra Supply P.O.Box 1390, Durango,CO 81302, $2.50 other sources, examplle Brigade Quartermasters

D cells standard - Wal-Mart $3/8 cells

D cells alkaline - Wal-Mart $5/6 cells D cells 20 year - $228/96 cells The Emergency Lifeline, 1425 Culver Drive, Suite A-474, Irvine,CA 92714 (714)558-8940

EMP protector - $35 Kootenai Radio & Energy, best prices in USA, Box 215, Kootenai, Idaho 83840 Also has solar panels and radios.

Flare gun - $80, shells $11 from Phoenix Systems Inc.

Flashlight, incandescent, plastic, cheap - Any dept.store $2

Flashlight, incandescent, plastic, good quality - Any store $6

Fluorescent lantern - Wal-Mart Ray-O-Vac $20

Gas valve shut-off wrench, domestic $5.29 from Preparededness Products or $8.50 from Emergency Lifeline

Generator flashlight - $7 from S.I. Outdoor, Food, & Equipment, P.O.Box 3796, Gardena,CA 90247 orders 1-800-533-7415, questions (213)324-8855 or 324-8859

Gunsafe, suitable for storing sidearms, $70 at most gun stores

Gunsafe, suitable for longarms, $150 at gun stores, $110 on sale at BEST Store

Hassock style portapotty - $40 from SI

Immersion heater - used $25 from Bob Lewis Army Surplus or new $80 Graingers

Instant cold pack - Walgreens $2 on sale

Instant hot pack - $7.95/6 Cabela's, or $2 at Walgreens
Iodine generator - crystalline "Polar Pure" $8.49 Indiana Camp Supply, P.O.Box 211, Hobart,IN 46342 (21)947-2525
This item could be produced for $2 each in lots of 50
Katadyn water filter - $180 (1987 price sheet) Kootenai Radio & Energy Systems Box 215 Kootenai,Idaho 83840 (they sell US distributor direct and are the least expensive source in the US for many radio, solar, & survival supplies)
Kearney Diet - See Nuclear War Survival Skills, approx. $250 for badult/year depending on type of packing (a discount from 30-70% for large quantities)
Krypton bulb - $3 for standard or alkaline batteries, $6 for ni-cads, (per pair) Spartan Supply box 310 Hixson,TN 37343 1-800-251-3904
Mace - common non-lethal temporary anti-personal spray $15/unit
Maglite (3 D cells) - Wal-Mart $20, Spartan Supply $16
Matches, water resistant - 96 boxes/$20 BW trading,box 692, Newark,OH 43055
Matches, life boat - 25 matches per vial, 5 vials/$10, Brigade Quartermasters, 1025 Cobb International Blvd., Kennesaw, GA 30144-4300 orders 1-800-228-7344, (BQ never has the lowest price, but in MANY cases they have quality equipment that can be found no where else)
Metal garbage can - Builder's Square $9, or other hardware store
Morman 4 - approx. $200 for adult/yr.(discount on large orders)
Morman 4 + 40 - approx. $300 per adult/year (ditto)
MRE - 50/$150 from Sierra Supply, Box 1390, Durango,CO 81302
MR8 - 50/$130 from Brigade Quartermasters
Nuclear War Survival Skills $10.95 each, or $80.00 for 10, plus postage (10%)
Oregon Institute of Science and Medicine, P.O.Box 1279, Cave Junction,OR (503)592-4142
Oak Ridge Laboratory Hazard-mitigating house plans - 1,200, 1,400, or 3,400 sq ft set of blueprints $25 from TACDA The American Civil Defense Assoc.Box 1057 Starke,FL 32091 (904)964-5397 phone, (904)964-9641 FAX
Plastic, 5 mil, Rolls - various sizes, $10-30, any hardware store
Portable sink - $30 Cabela's or Preparedness Products
PVC - Any plumbing supply store, price is relative to diameter
Rope, polyester - 50ft. 3/16" (#6) $4 any good hardware store

"solar" shower - $17 Cabela's

"space blanket" - See Aluminized mylar

"space" sleeping bag - See Aluminized mylar

Tarp, polyethylene - 5'x7' $3, 6'x8' $4, 8'x'10' $7, 8'x12' $8, 10'x12' $10, 10'x18' $15, 10'x30' $24, 12'x18' $18, 14'x24' $27, 15'x 30' $36, 20'x20' $32 20x40' $64, 26'x 40' $84, 40'x40' $128, 50'x50' $200 Pool Surplus P.O.Box 370 Benton,AR 72015

Tarpurethane, coated nylon, double seams, triple folded sides - 5'x7' $18, 7'x9' $25, 8'x10' $32 Indiana Camp Supply

Tents, used with no poles or tent stakes - 12' x 15' $200, 17' octagonal $250, 16' x 32' $350, 18' x 50' $500 Bob Lewis Army Surplus, Rt. 19, Box 162, Lebanon,MO 65536 (417)532-9657 9 miles south on Highway 5

Tents, new with poles & floor, no stakes - 12' x 14' $635, 16' x 18' $1.015 B&B Gun Sales, Rt. 2, Box 244, Groesbeck,TX 76642 (817)729-2631, other sizes also available.

Trioxane fuel tabs - $1.50 a box, discount for larger orders Infinity Self-Reliance Center, Box 382, Columbia,MO 65205

Uberlebens Nahrung - not available in the USA

Videotape, Fast Food Storage, - $7.00 from Preparedness Products

Videotape, Nuclear War Survival Skills- 1-4 371 minutes $30 each or set for $95 Oregon Institute of Science and Medicine, Box 1279, Cave Junction, OR 97523

Videotape, Practical Preparedness - 64 minutes $30 from TACDA

Videotape, Soviet Civil Defense 1-7 - 624 minutes - $30 each, set of 7 for $145 Available from and 1989 Copywright by OREGON INSTITUTE OF SCIENCE AND MEDICINE P.O.Box 1279, Cave Junction, Oregon 97523 (503)592-4142

Water bag, 5 gal with tap, box, human waste bag and disinfectant - 5 for $29 Preparedness Products 80 So. Redwood Road - Suite 215, North Salt Lake City Utah 84054 (801)292-3481 292-3483

APPENDIX #4

ADDITIONAL INFORMATION RESOURCES

BBSs (computerized "Bulletin Board System" accessible via and computer, modem, and phone line)

Literally thousands of pages of additional information are available at no charge by calling with computer/modem, KEN'S SURVIVALISTS' BBS 300/1200/2400 bps 24 hours per day, 7 days per week (except for maintenance routines) at (314)821-2815. All brands of computers are welcome with adjustable characters per line and lines per page or continuous readout for all monitors. All text files can be "TYPE"d with adjustable line length or downloaded with any of eight different protocols (seven with intelligent error correcting).

ExecuNet is a BBS service, prices start at $25/yr, in Illinois which has most of the files found on Ken's Survivalists' plus other files of interest to survivalists. Many of ExecuNet's additional files can be found on Ken's Survivalists' under the <N>ews area under ExecuNet Files.

Please check with ExecuNet for latest listing. is a full service system with 6 simultaneous phone line abilities at (618)397-4569, via P.C. Pursuit service at (618)451-5074, and in St. Louis, MO at (314) 772-9409.

MAGAZINES & NEWSLETTERS

Here are some newsletters and magazines of interest to survivalists.

DIRECTIONS - monthly newsletter of LIVE FREE, $15.00 year,$200 lifetime - 12/yr. Box 1743 Harvey,IL 60426 LIVE FREE is Jim Jones's organization and has been around for over 25 years. Articles cover all areas, mostly member submitted ,emphasis is on do it yourself and small group. Once you are a member you can also purchase the LIVE FREE papers and booklets. LIVE FREE sponsors many seminars and get-to-gethers every year.

SELF RELIANCE GROUP - monthly newsletter, $10/yr 1355 N. McCarran Reno,NV 89512, mostly reprints from ASG, and other sources.

THE LIGHT SPECTRUM - $18/6 issues/yr. Box 215 Kootenai, Idaho 83840 THE SOURCE for info on solar panels and communications

SURVIVAL TOMORROW - $48/12 issues/yr. p.o.box 910 Merlin,OR 97532 Homestead and do it your self oriented. Very good.

USEFUL INFORMATION - $20/6 issues Box 3132 West Palm Beach, FL 33402 Excellent, from woodsman, civil defense advocate David Lobdell. Also sells booklets How to build a 20 person permanent concrete fallout shelter for under $2,000. - $6, and How to live through a nuclear war - $16

FIGHTING CHANCE - $60/12 issues/yr. Box 1279 Cave Junction, OR 97523 Emphasis on steel-walled blast shelters.

AMERICAN SURVIVAL GUIDE (ASG) - $22/12 - $39/24, 12 issues per yr. McMullen Publishing, P.O.Box 15690, Santa Ana,CA 92705-0690 Large magazine covering all areas, tends to cater favorably to advertisers in its product review.

JOURNAL OF CIVIL DEFENSE - $18/yr. $34/2 yrs. 6 issues/yr. Box 1057 Starke, FL 32091 THE AMERICAN CIVIL DEFENSE ASSOCIATION's (TACDA) bi-monthly magazine. THE civil defense advocate magazine! Sells blueprints for shelters and banked earth houses.

THE TACDA ALERT - $8/6 issues/yr. TACDA's newsletter. You can get both newsletter and magazine with $35/yr membership.

AUSTRALASIAN SURVIVOR - $18(US$)/4 issues/yr Box 11, Dickson A.C.T. 2602 Australia Emphasis on on free enterprise, tool making, black smithing, hand built milling machines, etc.

SPECIAL REPORT SERVICE - $49(US$) Periodic reports from Bruce Silbey on various civil defense topics. Available from JOURNAL OF PRACTICAL CIVIL DEFENSE, 11 Newport Creent, Waddington, Lincolnshire, LN5 9LZ, England. His excellent book SURVIVING DOOMSDAY is available from here at $15 US.

Back issues of now defunct newsletters

Duncan Long's newsletters, last 12 issues $1.50 each, available from LIVE FREE Practical Civil Defense - Bruce Silbey's old magazine. $63(US$ ppd.)

for all three years VERY authoritative! Excellent resource for nuclear war preparedness. (see SPECIAL REPORT SERVICE for address)

Personal Survival Letter - Mel Tappan's old newsletter available from SI

Foresight - Dick Oster's old newsletter available from LIVE FREE.

There are many other survivalist newsletters but these are the most widely read.

The Survivalist Pledge from LIVE FREE INTERNATIONAL

To help all that can be helped,
To defend all that can be defended,
To save all that can be saved,
To free all that seek freedom,
To stay alive as long as I can and stay free as long as I live.

APPENDIX #5

VARIOUS SURVIVALISTS' PACKS AND LISTS

A favorite activity of survivalists is to compile checklists of needed supplies. Here are some of the better checklists that I have senn.

BESTLIST.TXT

The Best Survival Kit We Have Seen By: Steven D. Ramseur 17 Feb, 1990 From: Daniel C. Friend,
"The American Survival Guide" Vol. 12, No. 3, 3/90, p 30

Inventory for Basic Individual Survival Kit

Shelter and Warmth

"Emergency" space blanket
Heavy plastic trash bag, 2.5 mil
50 parachute cord, 25 ft.

Heat, Light, and Signaling

"9 hour" candle
waterproof matches and case
2 birthday candles for fire starting
Throw-away butane lighter
Magnesium fire starter
Card type magnifying glass
Police whistle on lanyard
Stainless steel signal mirror
AA or AAA flashlight
Surveyor's marking tape, 50 ft
3x5 index cards and pen

Knives and Tools

Swiss Army knife or Leatherman tool
Knife sharpener
Hemostats
Small "ignition point" file
Sharpened 6" piece of hacksaw blade
4" heavy duty sewing needle
6 heavy duty rubber bands

Water

Heavy plastic water bag, Zip-loc, 1 gal, 2.7 mil freezer bag
Iodine based water purification tabs
Large cotton bandana or bandage for filtering

First Aid

Clean cotton bandana or triangular bandage
Hemostats
Flexible fabric Band-aids
Handiwipes
Insect repellant
Aspirins or Tylenol
Mole skin or mole foam
Pepto Bismol

Direction Finding

Good quality liquid filled compass

General

Mosquito head net
Safety pins, 2 large, 4 medium
Telephone change
Snare wire, brass or copper
Survival Cards

This kit will fit into a large sized shaving kit, which is an excellent item to carry it in.

Additional items to include along with your pack
Individual serving of canned food, sardines or spaghetti, etc
A detailed map of the area you will be in
Separate first aid kit, including any needed prescription drugs
A small transistor radio
Extra pair of eye glasses in unbreakable case

Inventory of suuplimentation Kit

This is a supplementary kit of the same size (but different to carry in addition to the primary kit when possible.

First Aid

4 3"x3" sterile gauze pads
1 roll 2" Kling bandage
Trial size antihistamine tablets
Blister Pack of throat lozenges
Blister Pack of Pepto Bismol
Neosporin antibiotic ointment
Extra safety pins
6 flexible fabric band-aids

Signaling

Spare batteries for flashlight

Shelter and Warmth

4'x7' poly blanket or second space blanket for overhead shelter
Second "9 hour" candle
Another 25' of 550 parachute cord
Another disposable butane lighter

Food and Water

2 tins of sardines
Heavy duty nylon spoon
Snare wire
Another mosquito head net
Iodine water purification tabs
Another plastic water bag

The important thing to remember about this kit is that it can't help you

if it's not with you. Take it in the car, take it on vacation, carry it on the plane with you, take it on the boat with you, in other words, don't go anywhere without it.

The supplemental kit will help make things more comfortable, so carry it when you can, but remember, this kit is designed to save your life, not make you very comfortable. Resist the temptation to overload it with comfort items (mainly food) as this will make it more bulky. You will then tend to leave it behind. Food is NOT an essential item for many days. The small amount of high calorie food included is primarily cut to cut your hunger enough so that you can think clearly.

As Daniel C. Friend says in the article, "Survival is 10% knowledge, 10% Equipment, and 80% attitude".

CARLIST.TXT

Here is a list of what I have rattling around in the trunk of my car. - Ken S.

Misc. loose stuff

Jumper Cables
Wool Blanket
Poncho
"Space" blanket(aluminized mylar)
"Space" sleeping bag
Plastic reinforced tarp w/grommets, one side camo, other side aluminized mylar
Large Screwdriver
Vice-grips
Leather work gloves
Magnesium bar/flint
KA-BAR knife
Box of heavy trash bags.
Spare fans belts, fuel filter, oil filter, oil, wiper blades
Machete
Folding shovel/pick
Ground cloth (4 mil plastic drop cloth)
Spinner wrench

Halon fire extingusher
Fix-a-flat
Hand pump
Starter fluid
Tow rope w/hooks
12 volt DC spot light, flouresent light, and work light (magnetic mount)
Plank of wood (to use under car jack on soft ground)
Tire pump, tire gauge
Parka with 2 pr. gloves, wristlets (sock with toe removed to cover up the wrist between glove and sleeve), wool scarf, pen, pencil, paper, handkerchief
cheapo $9.95 style 40 pc. socket set english and metric
1 gal. of water
Wood for splints
Flares
Butane lighter

Medical kit (13" X 10 1/2" X 2 1/4" box)
Cotton swabs
Fever Themometer
"Kling" rolled gauze 4" X 5 yards
80 assorted strip and spot band-aids
4 pr. disposable gloves
Cylume sticks 1 red, 1 yellow
Wet-proof adhesive tape 1/2" X 10 yards
Paper adhesive tape 1/2" 5 yards
4 oz. drinking water, retort pack
Eye bath cup (1 Tblspn capacity)
Neosporin (antibiotic cream)
6 - 2" X 3" pads
7 - 2" X 3" adhesive pads
4 - Butterfly closures
5 - 1 1/2" X 2" pads
10 - 3" X 4" adhesive pads

7 - 4" X 4" pads
5 - 2" X 3" Biolclusive dressings
1 - triangle bandage
12 - safety pins
2 - 2 gal. zip-loc bags
1 - Cold compress, crush to activate type
Pump style snake venom remover
TRIAGE - EMERGENCY CARE HANDBOOK 191 pages 7" x 9"
Vial of Boric Acid Powder (1/64 tsp. of B(OH)3 to 1 Tbl. water for eyewash)
Vial of Alchohol
Vial of Hydrogen Peroxide
Vial of Witch Hazel
Vial of Dr. Orient's electrolyte replacement formula (dry)

Contents of 1 - 15" X 5 1/2" X 11" mortar box or 2 - 7" X 5 1/2" X 11" 50 cal. boxes (weight of mortar box 7.625 pounds, contents 10.625 lb., 18.25 lb.)
Wool Balaclava (pullover for head and neck)
G.I. leather/fabric mittens long wrist w/ wool liner gloves
Israeli gas mask w/filter
Wool socks
8 oz. butterscotch
Wire saw
Ontario pilot knife w/ sheath and stone
Dental floss, waxed (50 yd.) and unwaxwd (200 yd.)
3" X 5" signal mirror
Dental floss handle
Funnel w/filter paper holder
Filter paper (fast and slow)
Pocket purifier water straw
Cylume sticks, 12 hr. 2-red, 2-yellow, 1-green
5 feet glow in the dark string
Toothbrush
Vial of Iodine crystals
pocket knife

multi-sizing wrench
5 pr. disposable gloves
one dozen balloons
Potassium Iodide
Magnesium bar w/flint insert
box of waterproof matches
6 ft. tape ruler
Whistle w/lanyard
Folding camper's stove with 2 packs of hexamine
"space" blanket
"Dynamo" flashlight (hand squeezed generator flashlight)
500 aspirin
5 sticks gum
36 - 100mg caffeine tablets
3 - survival candles 2"D X 3/4" in metal cup
1 lb. baking soda
Butane lighter
7:1 block and tackle w/ 60 feet of rope
4 - 2 gal. zip-loc bags

HOUSELST.TXT

HOUSEHOLD ITEMS

AM/FM Radio / Solar Powered
Baking Soda
Batteries / Large & Small
Beef Jerky
Blankets
Booze & Beer
Bottled Water
Boullion Cubes
Candles
Canned Foods / all kinds

MEDICAL SUPPLIES

Hydrogen Peroxide
Multi-vitamins/Aminos/Vitamin C
Stitching Kit (for serious cuts)
First Aid Kit
Penicillin if available
Snake Bite Kit
Pain Killer (Tylenol, Advil etc)

CLOTHING ITEMS

Coffee
Decks of Cards
Feminine Pads
Fix-A-Flat
Flashlights
Garden Hose
Garden Supplies
Ice Chests
Knives
Light Bulbs
Lighter Fluid
Matches / Lighters
Needles & Thread
Notebooks
Pens/Pencils
Plastic Bags / Garbage Sacks
Pots / Pans / Silverware
Rags (cloth)
Sardines
Scissors
Soap / Shampoo
Spam and other canned meats
Spices
Suntan Lotion
Tang & Vitamin C
Tape / Duct & Electrical
Tea
Thermos
Toilet Paper
Tools
Water pump/purifying filters
WD-40

Fatigues
Hiking Boots
Rain Gear

SURVIVAL ITEMS

Air Compressor / DC power source
Backpacks
Battery Charger
Binoculars
Canteen
CB Radio
Campstove / Fuel
Chain Saws
Coleman Lantern / Fuel
Elecrical Wire
Fishing Gear
Gasoline / 5 Gallon Plastic Cans
Gun Oil
Guns & Ammo
Inflatable Raft
Lamps - 12V
Machette
Magnesium Fire Starter
Maps
Oil
Ammunition Reloaders & Supplies
Rope
Scuba Gear
Seeds - All kinds
Tent & sleeping bag(s)
Water Purifier Tablets

This represents a list that you can fill all, or part of, depending on your needs and requirements. Print the list and put a check-mark next to each item as you store it away. Don't try to fill this in a few weeks, but just try to get at least 1 item per week, store it away, and then go on to next. Some of the items are common sense, things that you should have in your house anyway in case of emergency or need. Others are more "hard-core" and you may opt not to purchase it - in that case, line through the item. - Mike McCormick

APPENDIX #6

The following are notes from a lecture on water.

The problems associated with water are acquisition, purification, and transportation OR get, good, and go.

FACTS

1 gallon of water weighs 8 1/3 pounds and is 231 cu. in. about 6 1/8" cube
1 liter of water weighs 1 kilogram and is 1 cubic decimeter

ACQUISITION SOURCES - RAIN, DEW, STREAM OR POOL, GROUND WATER (DIGGING)

PURIFICATION All water is good to drink, it is the extras that can kill you
-BIOLOGICAL HAZARDS

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     PHYSICAL REMOVAL - ULTRAFILTER or CONDENSATION
     KILLING ORGANISMS - BOILING or CHEMICAL
 -ORGANIC HAZARDS
     ACTIVATED CARBON FILTER or
     DISTILLATION *IF* 212 degrees isn't the boiling point of the hazard
 -INORGANIC  HAZARDS  (WILD WEST ADAGE, IF SLIME CAN DRINK IT SO CAN  YOU,  not
                      true due to biological contamination)
     pH ADJUSTMENT AND FILTERING
     ACTIVATED CARBON FILTER

ELECTROLYTES, you have to either replace lost electrolytes or die.

PRETREATMENT  All water purification will work better and allow your equipmnet
to last longer if you get rid of as much mechanical solids as possible.
  Cheap paper filters
  shirt, socks, pants, screen, Kearney bucket

  Absorbtion = incorporate
  Adsorbtion = block/stick

    Once you have your water, you need to purify it to make sure that it is
not contaminated with material that will cause sickness or death.  The most
common contaminants are
BIOLOGICAL - SOME THING THAT IS ALIVE AND HARMFUL
  E.  Colii  -  As the Infectious Disease specialist said, If shit  were  red,
                we'ld be living in a rose colored world.

ORGANIC TOXIN - SOMETHING THAT CAME FROM A LIVING CREATURE AND IS HARMFUL
   Venom, vitamin A, cyanide, micotoxins, etc.

INORGANIC TOXIC - SOME ELEMENT OR COMPOUND THAT IS TOXIC
   Berylium, cadmium, aluminum, arsenic, methyl mercury, lead, etc.

    The most common methods of water purification are boiling, adding
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disinfectants, and various types of filtering.
    Most biological hazards consist of naturally occuring bacteria and other organisms.

BIOLOGICAL HAZARDS
*   METHODS
        K KILL THE ORGANISM with a toxin that can kill all forms of life.
        M MECHANICALLY REMOVE THE ORGANISM from the water
K   BOILING. Boiling water for one minute will kill all bacteria. However, since additional various organisms that are harmful and commonly found in water are not bacteria, 15 to 20 minutes of boiling is needed to kill these other organisms to give you sterile water.

M&K   DISTILATION. Distilation is the most reliable method for obtaining pure water as the resulting water is sterile, soft, nuetral in pH and removes all other contaminates as well. If the distiller does not have some sort of system that preheats the water to remove various gases, the various gases can be collected in the distillate if all boiled off contaminants are not purged by running steam through the condensor at the begining of the batch.
K   DISINFECTANTS. The most common disinfectant is chlorine. Chlorine is a poisonous gas and hazardous to handle. Two safer forms of chlorine are common household bleach which is a 5.25% solution of sodium hypoclorite, and dry pool chorine ("burn out" or "shock treatment) which is 65% calcium hypoclorite. Dry pool chlorine can be used to make a solution that is the same concerntration as household bleach, 24.5 grams (about 10 Tablespoons) of powder in 1 gallon of water. This mixing MUST be done in a very well ventilated area and stored in an air tight enclosure since it gives off enough chlorine gas to cause problems. The most effective gas attacks in WW1 were done with chlorine gas.
Please note that many bleaches state, "not for human consumption."
If the listed ingrediants contains anything other than sodium hypochlorite, avoid it. If it contains ONLY sodium hypochlorite, it is okay. For water purification use 5.25% hypochorite solution in the following mixes
 Volume   clear water 1:5,000   cloudy water 1:2,500

1 Quart	2 drops	4 drops
1 Gallon	8 drops	16 drops
5 gallons	1/2 tsp.	1 tsp.

Allow at least 30 minutes for the chlorine to kill all microorganisms. Tuberculosis organisms are the only organism that is resistant to chlorine. Use a 1 to 10 solution for cleaning instruments and surfaces. Do NOT use hypochlorite solutions for irrigating wounds (as was done in WW1) as the hypochlorite dissolves blood clots.

Iodine is extremely toxic. One source of iodine are the solid crystals. How to use iodine to sterilize water. Put 4-8 grams of iodine crystals in a 1 oz. glass jar (must have glass or bakelite stopper otherwise the iodine will react with the plastic or metal stopper and destroy it.) Actually 0.1 gram is adequate for the job, but using a larger amount of iodine creates a saturated solution much quicker.

Put in 1 oz. (1 tablespoon or 3 teaspoons) of water (at least room temperature, body temperature prefered).

Close stopper and shake for several minutes. You now have a saturated solution. A saturated solution is when as much solid has disolved in a liquid as it can.

Carefully pour off 10ml (10cc, 2 teaspoons) of the saturated solution. REMEMBER, the iodine crystals are VERY TOXIC! The reason that adding more water than needed is suggested is so that you need not tip the bottle over too far thus spilling some crytals.

Add the 10ml (2 teaspoons) of saturated solution to 1 liter (1.06 quart) of water.

Let stand at least 15 minutes at 77 degrees F. or higher. Make sure all of the interior surface including lid get treated.

Another form of iodine is the familiar tincture of iodine which is 2% iodine and 2% sodium iodide in alcohol. Use 3-5 drops of tincture per quart of clear water and 10 drops of tincure in cloudy water. Please remember, very old tincure or tincure that has been left unstoppered may have lost some of its alcohol due to evaporation and whould have an excessive concentration of iodine.

NOTE: Iodine is not very soluable in water, but VERY soulable in alcohol

Betadines are not suitable for water purification. Betadine scrub should be only used for cleaning intact skin as it is very toxic to tissues. Betadine solution when diluted 1:100 (3 drops per ounce of water) is suitable for cleaning wounds.

M FILTERING. Only extremely sophisticated filters are precise enough to remove micro organisms. One device that is able to do this is the Katadyn family of water filters from Switzerland. It consists of a core of ceramic material whose holes are so small that no living organism can pass through. There are available synthetic woven filters for use in industry that are able filter out micro-organisms. Example, Coors beer is pastuerized by the micro filtration process.

Another type of filter is the 800 PSI reverse osmosis style filter, the Survivor-06 from Phoenix Systems $525 will remove salt for 2 pints per hour.

ORGANIC TOXINS

Many of these will be broken down by heat during the boiling of water or boiled away if they evaporate below 212 degrees.

NOTE on distillation. If you have a sophiticated still and put in the water, seal the still, and start the still - any toxin that boils below 212 degrees is going to pass right through on the first minute of distillation.

INORGANIC HAZARDS

Toxic substances like arsenic, various heavy metals, aluminum, salt etc. are a less common hazard. They can be found however in water near mining sites and in areas that have alkaline lakes. A lack of normal plant growth around a water source or unusually colored algae are frequently signs of abnormal pH or unusual contamination.

Many of these toxins are only water soluable if the water has an unusual pH factor. That is these factors can only be in solution in the water if the water is fairly acidic (low pH) or fairly alkaline (high pH). Totally neutral pH is 7 and most water sources will be between 5 and 8 in pH. If you have the papers to measure pH and add lyes or acids to the water to bring the pH within a normal range, the metal may go out of solution and become a solid, but in

particles that are so small that they stay suspended in the water. Letting the water set overnight will allow the particles to drop to the bottem, but since they are so small pouring the water from the container might be enough to put them back in suspension again. A better method would be to filter the neutralized water. A microfiltration filter could be used for this, but even common laboratory filter papers would remove most of the precipitated solids, even though common filter paper is not fine enough to filter out biological hazards. Many inorganics are highly reactive and are adsorbed by dirt or activated carbon filters.

Some inorganic hazards like asbestos fibers are mechanically hazardous, any filtration method will remove this items. If no filters are available, just letting the water stand still for several hours or overnight with help reduce contamination. Siphoning water off of the top of standing water is the best way to remove the water as pouring the container will kick up the sediment again.

A NOTE ON LABORATORY FILTER PAPERS

These filters should be used to prefilter any water that you are going to treat. They aren't suitable for an entire process, but their removal of larger contaminants improves preformance of disinfectants and extends the working life of microfiltration units. Filter papers come in various speeds. The faster the speed of the paper, the less that is filtered out. Filter papers are very inexpensive, lightwieght and compact. For maximum effect you can prefilter water through a fast filter and then put that water through a slow filter.

ORGANIC HAZARDS

These substances can be removed via activated carbon filters. An item to note about activated carbon filters: water or moisture in the carbon filters is a breeding ground for biological organisms. Many filters are doped with silver compounds to prevent or retard organism growth.

Note never pour hot water through activated carbon. Also, powdered activated carbon is more likely to release it toxin content.

Hartz Mountain 191 grams ~6 oz $2 dusty in cardboard box
VRP 300 grams ~10 oz $10 (three month supply) very low dust, in sealed plastic bottle

SOIL FILTERS

The book NUCLEAR WAR SURVIVAL SKILLS, in addition to having good information on water storage and transporation, has an excellent design for a water filter based on a bucket, gravel, towels and clayey soil (4" down). page 71-74

This device will buffer the pH (assuming normal soil) and adsorb 99% of radioactivity. It produces 6 quarts of water/hour initially and 2 quarts an hour after several hours of use. If you get 1 quart/ 10 minutes you need to repack the soil. Buy shaving off 1/2" of the 6-7" soil stack every time the filter clogs, you can get 50 quarts out before a complete soil change is needed.

ELECTROLYTES

Nutshell	single dose	storage ratios for 300 quarts
Lite salt	1 teaspoon	5 - 11 oz. tubes of Morton Lite Salt
Baking soda	1/3 teaspoon	one pound box
sugar	10 teeaspoons	25 pound sack
water	1 quart	

ELECTROLYTE AND FLUID REPLACEMENT

For those that do not subscribe to the FIGHTING CHANCE newsletter P.O.Box 1279, Cave Junction,Oregon 97523 $60/12 issues/year or haven't purchased the Medical Preparation video tape by Dr. Jane Orient (president of Doctors for Disaster Preparedness) $29.50 from same address, here is a good little life saver that you might be interested in.

One teaspoon of "Lite Salt"(by Morton, 1/2 iodized potassium chloride, 1/2 sodium chloride in a blue cylinder), 1/3 teaspoon of baking soda (sodium bicarbonate), 10 teaspoons of table sugar (sucrose), and one quart of water. That happens to be a life saving fluid replacement and partial electrolyte expiedent replacement. At least it is expiedent if you have had the foresight to purchase the above three items BEFORE an emergency happens while it is readily available and very cheap. Many people die in times of emergency because of fluid losses. This can be from burns, vomiting, or diarrhea. The body needs water and certian water souluable chemicals to function. If either or both of these drop below a certian level, you die. There are many non-fatal

diseases like cholera that become fatal due to lack of simple things like proper fluid replacement. If you have ever had a bad case of diarrhea and start to have pain in your muscles or joints, congratulations, you have had the early warning symptoms of a potassium deficiency.

Bananas are very high in potasium.

For ease of purchasing the items for Dr. Orient's formula, Morton Lite Salt comes in a 11 oz. light blue cylinder. Baking soda a 1 or 4 pound box. Sugar 5, 10, or 25 pound sack. To make approximately 300 quarts of the solution you need 5 - 11 oz. units of Morton's Lite salt, 1 - 1 pound box of baking soda, and 25 pounds of sugar.

FIGHTING CHANCE is a great publication for those that are installing blast/fallout shelters. It also is the place that tells you where to buy ventilators for $20 that other places charge $245.00 and in this month they tell you where to purchase 12-120 volt AC/DC PM motor generators for $12 that other survival stores sell for $100-275.

TOXIN STORAGE IN THE BODY

Most in fat cells, rapid fat burning without adequate water can cause kidney damage

HOW MUCH WATER IS ENOUGH? enough to keep your urine a normal color and smell

One exercise fitness center recommends
1/2 oz water per 1 pound body weight (sedentary) (me ~= 3 quarts)
3/4 oz water per 1 pound body weight (athletic) (me ~= 4 quarts)

In the dessert under heavy labor you might go through 2-5 gallons/day
Sweating = losing water + losing electrolytes

No activity in a cool cave 1 quart a day might be all you need short term with no bathing or food preparation needs.

In preparing for an earthquake, storing one gallon per person per day is a

good goal. Balance this with the percieved difficutly in obtaining, transporting, and purifying water from available non-utility or relief effort sources.

TRANSPORTATION

Page 67 of NWSS plastic trash sack inside pillowcase or burlap sack.

Canteens, plastic, steel, aluminum (aluminum + halide based tablets can produce toxins)

Water bags of aluminized mylar and boxes

Polycarbonate jugs

Folding bags with handles

APPENDIX #7

WHAT A HOMEOWNER SHOULD KNOW

Notes on preparing a house for an earthquake.

THE MOST IMPORTANT SINGLE ITEM - securing the hot water to prevent it from toppling over. This saves your inline water storage, prevents water damage, and prevents possible fire or explosion.

NEXT (in terms of easy to do) secure tall bookcases, cabinets, etc to the walls to prevent them falling over.

The most important for saving the total house is to make sure that the mud sills are bolted down to the foundation. If you have cripple wall construction sheeting needs to be applied to the cripple wall. See the books below for size and spacing of bolts.

Books to read:

Nuclear War Survival Skills is a good basic eduction on how to live without utilities.

What used to be the Earthquake Engineering Research Institute now has its publications available from the Center for Environmental Design Research, 390 Wurster Hall, University of California, Berkeley,CA 94720 (415)642-2896. The catalog Publications in Print, is free. Only pages 51-62 concern seismic hazards. All publications are sold at cost and shipped book rate at no additional charge. For 1st class mailing add $3 per book or $6 per for overseas. If your house is simple wood frame you'll want to order Earthquake Hazards and Wood Frame Houses: What you should know and Can Do, CEDR-02-82 for $6.00. If you buy just one book, make it that one. Other books for frame housing are, An Earthquake Advisor's Handbook CEDR-03-82, $7.00 and perhaps Architectural Planning and Design Concerns for the Performance, Repair and Retrofit of Existing Building, CEDR-WP01-85 $3.00. If you have a masonry (structural) house there are quite a few books you might want. Seismic Strengthening of Unreinforced Masonry Buildings - A Design and Cost Guide for Architects and Engineers, CEDR-04-07 $10 (or $12 with diskette of Lotus 1-2-3 overlay for cost estimation), Unreinforced Masonry Seimic Strengthening Workshop and Cost Analysis, CEDR-01-87 $12, Masonry as a Ductile Material: Traditional and Contemporary Construction Practices Utilizing Unreinforced Masonry in Seismic Areas, CEDR-R06-87 $3, Traditional Masonry and Contemporary Reinforced Concrete Frame in Infill Wall Construction in Seismic Areas, CEDR-R01-87 $3, Bond Iron and the Birth of Anti-Seismic Reinforced Masonry Construction in San Francisco, CEDR-R01-86, $2.75, The Uses of Masonry in Earthquake Zones: A perspective on Traditional and Contempory Construction Practices Utilizing Unreinforced Masonry CEDR-WP05-87 $5.25, A History of Reinforced Masonry construction Designed to Resist Earthquakes: 1755-1907, CEDR-R02-84 $3.00, and Unreinforced Masonry Buildings: Seimic Behavior and Renovation, CEDR-05-82 $10.50, whew. Obviously a masonry structure, due to its incresed weight and therefore amount of inertia is more difficult to protect.

Many of the suggestions on the frame house retrofit are moderately simple like drilling holes in the sill (mud) board and foundation to add extra tie down expansion bolts or attaching plywood pieces to cripple walls. The rule of thumb here is light frame house 1/2" bolts every 6', medium - 3/4" bolts every 6', heavy - 3/4" bolts every 4', with a bolt no more than 12" from every

corner and no more than 12" from every board end. The coverage of cripple walls depends on several factors, see charts. Other suggestions are a bit extreme. Few people will want to tear the interior wall facing off to reinforce junctures and walls. One thing to note. A minor upgrade might not save your house from being a wipeout in financial terms, but it might save the lives of the people inside it.

GLOSSARY

2, 5, or 10 Meter HAM radios - You must be a licensed Amatuer Radio Operator to run these units. The license only requires 5 words per minute in morse code (25 characters per minute) and some very basic radio theory. Great choice of frequencies available, example 2 meter has 800 channels.

40 channel SSB CB - Citizen's Band radio (no licensing requirements) with 40 channels in AM, 40 channels in Upper side band, and 40 channels in Lower side band. Conventional CBs have just the 40 AM channels, which will probably be clogged in an emergency. Note: when a channel is being used in the AM mode, the SSB channels can not be used. conventionally, the uppermost (35+ or 30+) channels are reserved for SSB (single side band usage)

45 ACP revolver and shotshells - 45 caliber pistol must be purchased and registered by an individual. Even with conventional ammo a pistol is only useful as a short range weapon. The use of shotshell converts the pistol into what amounts to a short range .410 shotgun and is ideal for rodent, snake, and small animal control. A shotgun is unwieldy and bulky. The shotshell is also powerful enough to be useful in controlling criminals.

Activated charcoal filter - water filter to remove chemically reactive

pollutants and is most effective if the water has first passed through filter paper to reduce turbidity.

Aluminized mylar blanket Ie."space blanket" - Extremely compact and lightweight (though very noisy) mylar sheet that has been coated with an waluminum film which will reflect 80% of body heat, will not allow wind to pass through.

Aluminized mylar sleeping bag Ie. "space" sleeping bag - same as above but in the size and shape of a sleeping bag instead of a flat sheet.

AM/FM radio - It would be nice if radio selection could be limited to units that either use D cells or for which external D cell adaptors could be made. This would reduce the need to inventory different battery sizes and also extend the number of hours of use of the unit before battery replacement is needed. Unfortunately most D cell portable radios are large and expensive. An excellent alternative is an AM/FM radio that has self contained solar cells, hand powered generator, and integral nickel cadmium batteries.

AM/FM/TV radio - As above but can receive the voice portion of VHF TV

Ammo cans, military - heavy, durable, air and watertight steel or plastic boxes of all sizes and shapes. Useful for storing all manner of items.

Audiotape, How to Survive a Major Earthquake, 32 minutes - a good introduction to the topic of earthquake preparedness

Brinkman (imitation Mag-Lite) - My experience with flashlights that look like Mag-Lites but are a few dollars cheaper has been a disaster. A waste of money.

Cap-stun - the best of many brands of non-lethal debilitating aerosol

Cyalume sticks - a photochemical light source which, while not very bright, produce no heat or sparks during operation or activation and are totally waterproof in storage, activation, and use. Completely soft plastic with no sharp or hard edges and can't generate sparks by being bumped against other materials. Handy eyelet for attachment. There are 12 hour versions that are fair for 2-3 hours and dim, but bright enough for identifiers for the remaining time. There are 1 hour or 30 minute versions where a brighter light is needed for a short time. Available in red, green, blue, yellow, and white.

D cells standard - normal carbon zinc batteries. Cheap, but prone to leakage need to be rotated every few years.

D cells alkaline - alkaline battery. Cost more but less likely to leak and have a five year 80% charge life.

D cells 20 year - a cell in which the chemical components are isolated from each other until the cap is twisted. When activated, voltage & power is similar to a standard D cell.

D cell nickel-cadmium - popular rechargeable battery. Only puts out 1.2 volts per cell (normal carbon-zinc or alkalines produce 1.5 volts). Must be recharged frequently. Acquires a charge limit if not fully charged after full or partial discharge which can only be normalized by full discharge and full recharge. Has a very sharp discharge slope. Ie. when it starts let a light go dim, it goes out quickly whereas other cells will continue to keep the light dim for a long time.

EMP - ElectroMagnetic Pulse - multifrequency radio wave capable of burning out solid state electronic components such as microchips and transistors. EMP is caused by nuclear explosions. If the nuclear explosion is inside the atmosphere, the EMP range is very small. If the explosion is outside the atmosphere, the radiation strikes the atmosphere and can create the EMP wave thousands of miles from the explosion. One well placed explosion in orbit above Omaha could knock out all semiconductors from L.A. to N.Y. This would cause a greater loss of life and property damage than a bomb going off in a single city and might be the next terrorist threat in the 21st century. EMP will be picked up by any item that can act like an antenna and conduct the EMP burst to equipment. An EMP protector must be installed in series with the antenna or power cord or phone line of any radio, computer or other solid state device which might operate in a nuclear war environment. Lightning protectors are not useful against EMP as the rise time of EMP is MUCH faster than a lightning pulse.

Flare gun, shoots 26.5 mm NATO flares, 350' elevation, 6 sec. burn time

Flashligh, incandescent, plastic, cheap - assume 10% will break during use

Flashlight, incandescent, plastic, good quality - more durable, better lantern, battery operated which is much better than flashlights since

they produce a greater quantity of light with less glare and better distribution than an incandescent at a lower drain rate on the batteries

Gas valve shutoff wrench - a wrench specially designed to turn off gas valves in emergencies that will not cause dangerous sparks and will not corrode if attached to the gas valve by rope to the gas valve or located near the gas valve under shrubbery if vandalism is likely, see Rope.

Generator flashlight - you squeeze a lever which turns a dynamo, you have to keep pumping for light, they are cheap and will wear out under heavy or careless use, unless you can find a true military model

Gunsafe, suitable for storing sidearms, opens with adjustable push button code approx 4"x8"x12" and useful for storing various items

Gunsafe, suitable for longarms, opens with tubular key approx 1.5'x1'x4' and useful for storing all sorts of items

Hassock style portapotty - plastic drum with conventional toilet seat, more comfortable than box type but costs 5 times as much, can be used for storing supplies when not in use

Immersion heater - kerosene powered water heater which is put inside metal garbage can, heats a lot of water very quickly to boiling

Instant cold pack - chemical pack that becomes cold upon activation

Instant hot pack - many styles, most are single use either continuous or can be put in air tight bag and "paused", costly ($20) style can be recharged

Iodine generator, crystalline - this consists of a small glass bottle with a lid the iodine won't dissolve, called a generator since you use it to create a saturated solution of iodine/water you add to a quart of water, under normal temperatures it will sterilize the water in 20 minutes.

ISC - Infinity Self-Reliance Center, P.O.Box 382, Columbia,MO 65205. A training institution that can fabricate courses for anybody's educational needs. Weekend or week long courses are available on pupil selected topics if a suuficient number of students want the same topic at the same time.

Katadyn water filter - based on a ceramic microfiltration core that is so fine no living organism is small enough to pass through including giardia

Kearney Diet - the Morman 4 plus beans for better amino acid balance in proteins and a source of oil for essential fatty acids both of which is

lacking in the Morman 4

Krypton bulb - produces a much brighter light than a standard incandescent bulb, use the krypton unit and save the normal flashlight bulb for a spare

Mace, or tear gas - traditional non-lethal non-permanent anti-personnel aerosols, there are better systems now available for the same price

Maglite flashlights (available in 2 AAA, 2 AA, 2,3,4,5,6,7 C, 2,3,4,5,6 D cells) are made of machined aluminum and are more reliable and durable than plastic flashlights though they are more expensive. The focus of the light beam is adjustable from spot to flood. While they are advertised as waterproof, I would not trust them to be explosion proof.

Matches, water resistant - should work if damp, but not wet. They need a special striker surface to light in any case.

Matches, life boat - basically a heavy duty friction match dipped in a burnable varnish, when wet will light on any rough surface.

Metal garbage can - suitable for use with immersion heater which would melt the bottom out of a plastic garbage can

Morman 4 - survival rations developed by the Morman church of Latter Day Saints designed for economy and long shelf life, consists of wheat, sugar, salt, and dried milk.

Morman 4 + 40 - the Morman 4 plus 40 rotated canned goods for improved taste and variety

MRE - Meal Ready to Eat, retort packaged meal containing a full balanced meal for combat soldier, outer bag contains separate retorts of entree, crackers, cheese, jelly, candy, cocoa mix, and fruit depending on pack. All packs contain accessory pack of toilet paper, pepper, salt, chewing gum, spoon. Can be stored up to ten years under ideal temperatures.

MR8 - NATO approved compact ration bar containing minimum daily diet requirements. Neutral tasting, it can be eaten with or without water or heating. It can be made into porridge or crumbled over other foods. Each pack contains four individually packed two part portion with 1040 calories. The all vegtable source contains added sugar. Protein 15.1%, Fats 14.9%, Carbo. 64.1%, Moisture 4.5%, Minerals 1.4%

Nuclear War Survival Skills book, 1987 version 282 pages with index - While

the main point of this book is to teach you what to do before, during and after a nuclear war to survive, it is a great source of information on how to live without utilities for extended periods of time. Unlike other survivalist books, the use and purchase of specialized survival equipment is not covered, instead, it illustrates how to create that special equipment from readily available common household items.

Nu-Light - Yet another imitation Mag-Light. Junk.

Oak Ridge National Laboratory Hazard-mitigating house - a series of blueprints for constructing 1,200 sg ft.,1,400 sq.ft, and 3,400 sq.ft. underground houses that can be converted to blast/fallout shelters with sandbags and railroad ties.

Plastic, 5 mil, Rolls - can be used to create tents, see Nuclear War Survival Skills book for proper technique

Portable sink - black plastic 5 gal. water container that is a sink, stoppered drain, and pump faucet, being black it will heat up water if left in the sun.

PVC - PolyVinyl Chloride pipe used in plumbing. Available in 1", 2", 3", 4", 6", 8". Can be cut with a hacksaw to any desired. Glue a cap on one end and a screw base on the other. Coat threads with thread sealant, screw in cap and you have a wonderful lightweight, rust proof, non-corroding, air and water tight container, that will last for decades, for storing survival goods either above or below ground.

Rope, polyester - The best rope to use to secure your emergency gas wrench to your gas valve. Unlike manila or sisal rope it won't rot when left wet,and it is less degraded by sunlight that nylon or polypropylene ("poly") rope. Rope is preferred over metal chain as metal chain could create aspark. Be certain to leave plenty of slack in the rope to maneuver the wrench. Storing the wrench in the basement isa bad idea because it may be inaccessible when needed. Securing the rope is advised if theft is likely. To reduce theft, melting instead of tying a knot is advised.

"solar" shower - 2.5 or 5 gallon bag that is insulated on one side with foam and reflective barrier and clear on the other side. It will heat water if left in the sun. Top has loops and rod for hanging from tree branch and bottom has hose, valve, and shower head

"space blanket" - See Aluminized mylar

"space" sleeping bag - See Aluminized mylar

TANSTAAFL - There Ain't No Such Thing As A Free Lunch!

Tarps - poor man's tents running the gamut from worthless to Hurculean

Tents - Used patched surplus Military tents are the best buy. You get twice the size at 1/2 the price of new tents. They ARE heavy, but very good.

Trioxane fuel tabs - easy to light, burns very hot, compact, smokeless fuel for heating rations but can not be stored long after opening original packet

Uberlebens Nahrung - Food powder formulated by Nestles for Swiss Civil Defense System. Used for a beverage base, soup, gruel, or paste. Closest similar item available in the USA would be MR8s.

Videotape, Nuclear War Survival Skills 1-4 - While most of these tapes cover topics more appropriate for nuclear war or nuclear power accidents, they do cover a lot of information on how to live without utilities.

Tape 1: Expedient Blast and Radiation Shelters (102 minutes)

Tape 2: Shelter Ventilation and Various Other Survival Skills (78 minutes)

Tpae 3: Home-makeable & Commercial Fallout Radiation Meters (117 minutes)

Tape 4: Nuclear War Facts as Told to Teenagers (74 minutes)

Videotape, Practical Preparedness - This is an EXCELLENT tape as it covers all aspects of what a home owner can do to live through a disaster situation in safety and comfort. If you view only one tape, make it this one. Total time 64:00, Mains topics are heat, shelter, sanitation, food, water.

Videotape, Soviet Civil Defense 1-7 - These tapes show the very extensive training and preparations being made by a culture that has a very low standard of living but devotes 2% of its Gross National Product to Civil Defense. It not only teaches survival skills but also is useful when comparing how the USSR, the Scandinavian Countries, Red China, Switzerland, Israel, and the USA treat preparation for disaster.

Here is what is on the back cover of the tapes:

"Civil defense in the Soviet Union is a $6 BILLION per year defense

effort with 150,000 PAID PROFESSIONAL and 20 MILLION VOLUNTEERS working to prepare Soviet citizens for civil defense procedures including the use of their $200 BILLION CIVIL DEFENSE SHELTER SYSTEM. Little known in the West, Soviet civil defense constitutes an entire branch of the Soviet military and an important part of Soviet education with mandatory civil defense courses beginning in the 5th grade.

Now the Oregon Institute of Science and Medicine, which distributes extensive written, audio, and video tape information on civil defense procedures and preparations, has produced this definative seven video tape series on Soviet Civil Defense. The tapes feature extensive information from the leading American authority on Soviet civil defense, Dr. Leon Goure, 15 actual Soviet civil defense training filmstrips for adult training, and 2 filmstrips prepared for use in Soviet 5th grade classes. With English translations in the soundtracks, these include: 1. Injury from Fallout Radiation Can Be Avoided 2. Actions in the Face of Nuclear Attack - The Main Point is Not to Panic 3. The Shelter - A Dependable Means of Protection 4. What You Must Know About Nuclear Weapons 5. Learn How to Use Your Gas Mask 6. The Danger of Bacteriological Weapons 7. Blast Shelters, Fallout Shelters, and the Rules for Using Them (5th grade) 8. Skillfully Respond to the Threat of Attack and to Warning Signals (5th Grade) 9. Protecting Livestock 10. Dealing with Public Utility Emergencies 11. Fallout Shelters and How to Build Them 12. How to Counteract Chemical Contamination 13. Countering Pathogenic Bacteria 14. Fire Fighting 15. The Reception and Billeting of the Evacuating Population 16. If the Siren Sounds 17. After Departing the Area of Destruction

Tape 1: Introduction and Interview of Dr. Leon Goure (97 m)
Tape 2: Soviet Training Manuals, Books, & Journals - Section 1 (86 min.)
Tape 3: Journals - Section 2 and Soviet Training Film #1 (81 minutes)
Tape 5: Soviet Traing Films #7, 8, 9, 10, snd 11 (91 min)
Tape 6: Soviet Training Films #12, 13, 14, 15 and 16 (89 m)
Tape 7: Presentation by Dr. Leon Goure, Soviet Training Film #17, and Soviet Civil Defense Posters (92 m)"

Water bag, 5 gal with tap, box, human waste bag and disinfectant - 5 boxes

that can be used for either storing, carrying, and stacking water bags or for box toilets with human waste bag and disinfectant. Water bag includes tap and is made from aluminized mylar, which unlike other plastic water containers, is totally opaque, to prevent internal growth of bacteria, and gas impermeable so water will not absorb surrounding chemicals, flavors or smells. Water bag can hold 6 gallons when not in stacking box.