INTRODUCTION

The Yukon government recognizes its responsibilities to aid and assist the public in preparing for and responding to disasters which threaten life and property.

Local authorities and/or municipal governments respond first, but may call upon other levels of government to help. Every level of government has its share of responsibility for public safety and assistance to disaster victims.

The Yukon's Emergency Measures Organization helps communities develop and maintain a high level of emergency preparedness and response capability. Volunteers enrolled with the organization play an important role in helping communities achieve their emergency preparedness responsibilities.

At one time or another residents in the Yukon may find that they, their family, home and property are threatened by any one of a variety of natural disasters such as earthquakes, mud slides, violent storms or floods.

This booklet is intended to provide information for use by individuals should their home be threatened by a flooding situation. The information provided represents general tips for consideration and is provided to help Yukoners be better prepared to deal with the perils of a flood.

Yukon
Community and Transportation Services

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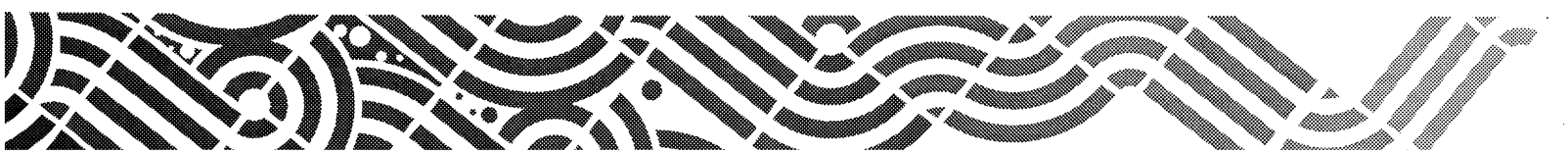

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POLYETHYLENE SHEETING

A reliable source of protection for your home and most other smaller buildings during severe flooding conditions is the proper use of polyethylene (plastic) sheeting.

The following is a brief description of how, according to dyking engineers, an individual can provide protection to his or her home should potential flooding conditions be considered severe enough to require evacuation.

This system has been successfully used throughout Canada and the United States and is recommended for structures located in areas where flood depth is anticipated to extend above the level of the structure's first floor. It is not considered necessary in areas where only basement or crawl space flooding is expected.

Polyethylene sheeting is intended to add extra protection to the building's structure, but "sheeted" buildings are not considered suitable to live in once the sheeting has been completed. Use this procedure only if evacuation is anticipated.

Procedure:

The exterior lower levels of a home to be evacuated are wrapped with polyethylene sheeting, secured at joints with nailed strips of wood and anchored around the structure's foundation with sand bags or other heavy objects.

For greatest protection, the use of 6-mil polyethylene sheets in 3 metre widths is recommended.

Step-by-Step Instructions:

Should your home or other structures be located in a area where flooding above the first floor level is forecast, you may wish to do the following:

1. Listen carefully to the forecast and determine how high the predicted flood level will be, then allow an extra metre of coverage beyond that height.

2. Remove all valuables from the basement, turn off and disconnect all power and gas lines and remove all electric motors from the furnace and appliances which will remain in the basement during the flooding period.

3. Securely plug all basement drains and outlets such as: sewer drains, sinks, toilet bowls and laundry outlets to the sewer. It may be necessary to plug some outlets below the level of the weeping tile drains, in the primary sewer trap. Effective plugs can be made from wood or plastic bags. All plugs must be held in place by sand bags or other heavy materials, or held in place by braces securely fastened to floor joists.

4. Move all possessions within the structure to above the projected flood water level.

5. Flood the basement with clear water from an outside tap through a basement window. Bring water level inside the basement to window casement level.

6. Board up all windows, doors and other openings.

7. For additional protection against the force of outside flood waters, brace the walls of the structure from the inside by nailing "two-by-six" lengths or planking one metre above the floor. Once the two-by-six "walers" are in place, add braces constructed from strips of two-by-fours, running at a 45 degree angle from the "walers" to the floor and hold in place by either sandbags, or wooden blocks nailed directly to the floor.

Recommended Method for Individual Dwelling Protection

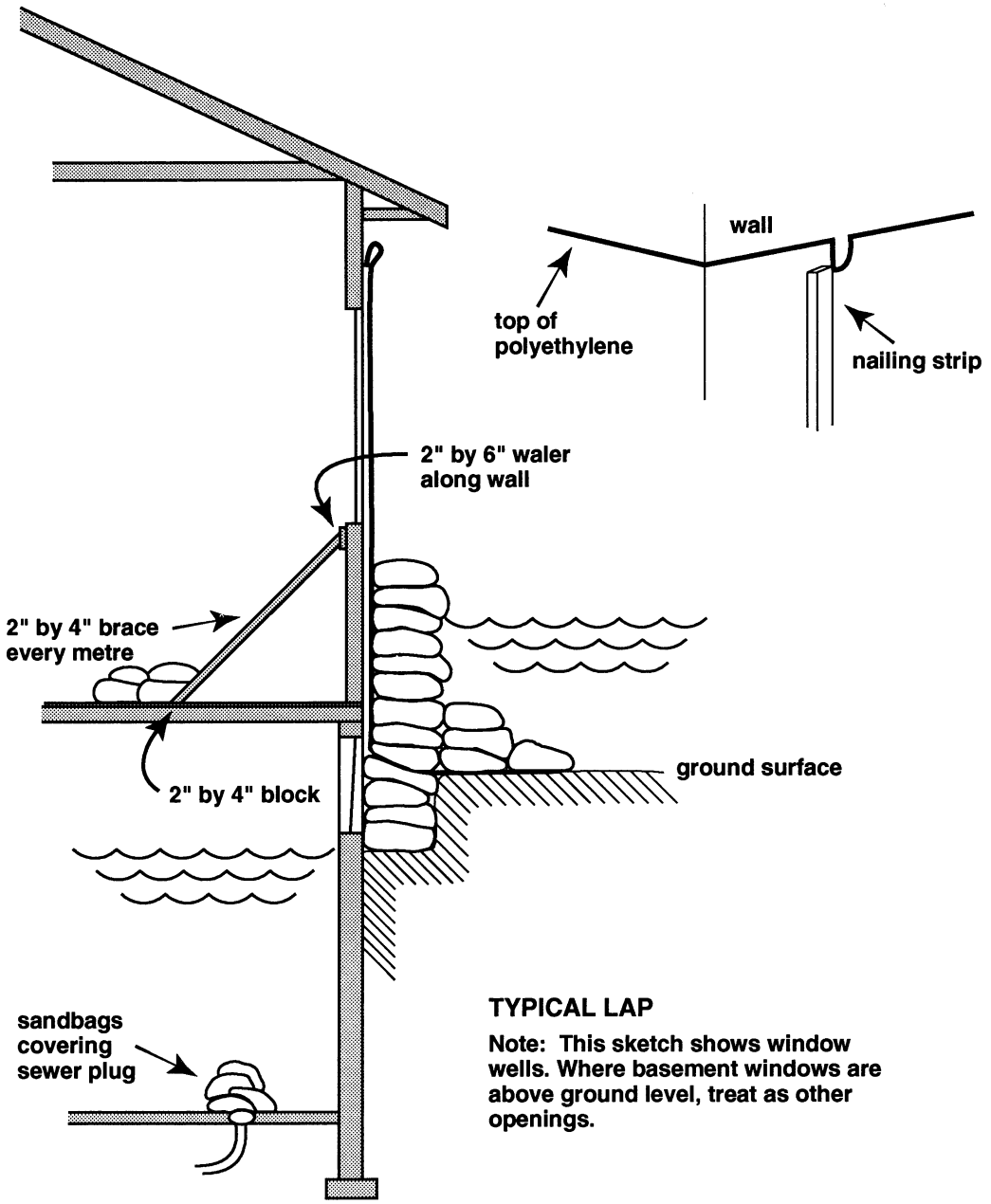
A. Remove all goods from basement, pull all electric and gas motors.

B. Plug drains, flood basement with CLEAN water to basement windows.

C. Remove all home furnishings and store above predicted crest.

D. Apply 6 mil. polyethylene LOOSELY to the exterior siding. BOARD ALL OPENINGS.

E. OPTIONAL Brace exterior walls every metre from the inside.



TYPICAL LAP

Note: This sketch shows window wells. Where basement windows are above ground level, treat as other openings.

Note: This sketch describes a method of protecting an individual dwelling from flooding using polyethylene and sandbags. Although the method has been successful, constant surveillance and maintenance of the emergency flood barrier is a requirement throughout the duration of the flood. This method is **not** recommended where the predicted crest extends 1.3 metres over the water level in the basement.

8. Apply the polyethylene barrier loosely to the exterior walls of the structure, starting at a height of one metre above the predicted flood level. Allow an additional one metre at the base of the structure for anchoring. At joints in the sheeting, allow a minimum one metre overlap. Place sand bags around the house against the polyethylene. Stack the bags in an overlapping fashion and at least 10 bags high.

9. At the base of the first stack of sand bags lift the remaining polyethylene sheeting up and cover the outside face of the initial sandbags, hold the plastic sheeting in place with a second wall of sandbags.
(See diagram on page 3.)

If you should choose to use the "plastic sheeting" method described here, you must remember that regular inspections of the structure will be necessary to ensure the plastic has not been ruptured and the sandbags have remained in place.

Although this procedure does provide additional protection during severe flooding for many structures, it does have some limitations. The most important limitations are:

a. The use of polyethylene sheeting to protect a structure is recommended for frame buildings where the anticipated flood level will not exceed a height of 1.5 metres above the window casement level of the basement.

b. The basement must be filled with water to avoid the danger of collapse of the foundation from exterior water pressure.

c. Once the structure has been sheltered in polyethylene it is no longer suitable for habitation until the sheeting is removed.

d. This method should never be used on concrete block foundation walls.

SANDBAG DYKES

Construction of a sandbag dyke requires special procedures to achieve maximum strength and effectiveness. Should you choose to construct a sand bag dyke to protect your property in the event of a flood, the following tips may be useful.

1. Strip the sod or ground cover beneath the area for the proposed dyke and dig a "bonding trench" one sack in depth and two sacks wide as a foundation for the dyke structure.

2. To effectively provide protection from the forces of flooding water a dyke must be three times as wide at its base as it is high. A dyke intended to be one metre high must have a three metre wide base.

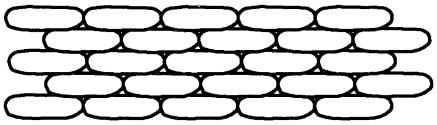
3. Sand bags should never be filled more than half-full and must be laid in alternating criss-cross directions. The base level should be laid parallel to the flow of the water, the second level should be laid perpendicular to the flow, with the third level again laid parallel, continuing to the intended height of the dyke. Each successive layer is set back one-half sandbag width on both sides in each additional layer. A side view of a completed dyke would show a triangular cross section.
(See diagram page 5.)

4. Individual bags need not be tied shut. Overlapping by successive bags will hold the sand in place. The method of keeping bag contents in place is called "lapping"

5. As individual bags are put in place, each must be tamped firmly to ensure maximum performance and strength in the finished dyke.

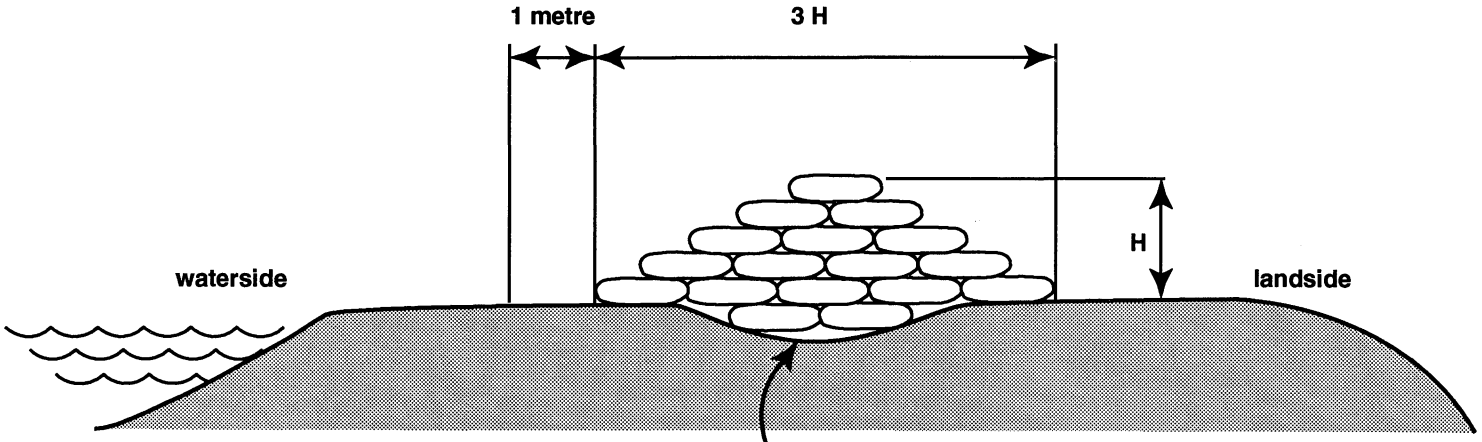
Recommended Method for Sandbag Dyking

Bags Required for 100 Linear Feet of Dyke	
Height Above Dyke	Bags Required
1/3 metre	600
2/3 metre	2000
1 metre	3400



PLAN OF BOTTOM LAYER

METHOD OF LAPPING SACKS



SUMMARY

1. Alternate direction of sacks with bottom layer, i.e. bottom layer lengthwise with dyke, next layer crosswise.
2. Lap unfilled portion under next sack.
3. Tying or sewing of sacks not necessary.
4. Sacks should be approximately one-half full of clay, silt or sand.
5. Tamp thoroughly in place.

ADDITIONAL CONSIDERATIONS FOR HOUSEHOLDERS

Additional considerations for householders to help prevent flood damage include:

1. If eaves troughs are connected to the house sewer system, disconnect them and re-channel the flow to points more than 1.3 metres from the buildings foundations. This will help reduce the flow of water into the community sewage system.
2. Dangerous chemicals such as weed killer, insecticides and corrosives should be removed to dry areas to reduce the dangers of chemical contamination, fires, explosions and personal injuries.
3. Buoyant materials should be removed from the basement to lessen potential for damage to first floor components of the structure should the basement flood.
4. If you plug the basement sewer, be sure to remove the toilet bowl from any basement bathroom and plug that sewer drain securely as well.
5. For additional information on preparing your household for flooding, you may wish to ask the assistance of a professional plumber.

If, through taste, colour or odor you suspect your drinking water is contaminated, do not drink it.

Contaminated drinking water may be purified by boiling, by adding purification tablets (if available), or by adding household bleach. In most situations adding two drops of normal strength bleach to each litre of water is recommended. Allow the treated water to stand for at least 30 minutes before drinking.

ELECTRICAL POWER

In any area where immediate flooding is anticipated, it is essential to shut off all electrical power. In an urban area homeowners are advised to shut off the power by opening the main service switch. In a suburban or rural area the yard switch must be opened.

Entry into a flooded room or basement where electrical power is believed to still be active should never, under any circumstances, be attempted. When disconnecting the power source it is essential to be standing on a dry platform. Avoid approaching any master switch if it is surrounded by water. The switch may be opened through the use of a non-conductive dry material such as a dry wooden stick or insulated tool of some sort.

An additional precaution you are to consider if involved in rescue work, or if you are returning to property abandoned during a flood, concerns possible submerged electrical cables. In some flooded areas water levels may reach or submerge power bearing electrical cables. When operating a boat in flooded areas extreme caution must be exercised to avoid coming into contact with "live" wires.

If your home is threatened by immediate flooding it is important not only to be prepared for the flooding, but to make as many preparations as possible for the return to normal living once the flood has subsided.

Some things to consider include:

1. If appliances such as deep freezes, furnaces, washers and dryers cannot be moved above the anticipated flood level, then electrical controls and motors should be removed to prevent water damage and expensive repairs. If an electrical motor has been submerged in water no attempt should be made to operate it until a complete overhaul and cleaning has been completed.

2. All insulation of thermally insulated appliances must be replaced before operation if the appliances have been partially or completely submerged. These appliances include: water heaters, refrigerators, freezers and ranges.

3. Electric baseboard heaters and portable heaters must be moved above water level. It is doubtful such items could be rendered safe for operation once submerged.

4. Portable electric appliances such as kitchen blenders and mixers, as well as power tools must be kept dry, or not operated until completely dried, cleaned and overhauled.

5. Radios, televisions, stereo systems and other home electronic systems must be moved above the flood level. Repairs to such items following submersion is not practical.

6. In order to prevent fires or dangerous short circuits all wiring in homes and other buildings which have been partially or completely flooded must be inspected before being placed back in service.

GAS FIRED APPLIANCES

Ideally, if enough advance warning is provided of a potential flood, homeowners should have a professional contractor remove electric motor, burners and controls. If such help is not available, these are the steps you may wish to take.

1. Shut off the supply of all electrical power to the appliance and leave it off.
2. Shut off the gas supply valve to the appliance. These valves are usually in the gas line near the bottom of the appliance.
3. On warm air circulating furnaces remove the electric fan motor and, if possible, the fan unit as well.
4. For a hot water circulating system, remove the circulating pump motor, but do not try to remove the pump unit from the piping system.
5. If advance warning time allows for the removal of gas fired clothes dryers, ranges and other such appliances it is essential to shut off the gas valve. It is also essential to cap the open end of the pipe leading from the valve to the appliance to prevent the back flow of flood water into the gas piping system. This may be accomplished by using plugs or pipe caps available at most hardware and plumbing stores.
6. If the hot water tank cannot be moved, do not drain. Shut off pipes leading to and from it and leave it in place.
7. Secure propane tanks that cannot be moved. (Note: propane tanks are buoyant even when full)

Once the flood waters have subsided, do not attempt to place gas appliances back in service yourself. This work must be carried out by a licensed professional.

PROPANE TANKS

Although located outside the structure, propane tanks can cause damage and have the potential for devastating explosions if ruptured and exposed to a spark. Such tanks are costly to replace as well.

Because propane is considerably less dense than water, even a full tank is extremely buoyant. Secure anchoring is a necessity for flood conditions.

Here are some steps for you to follow:

1. Turn off the valve at the tank.
2. Disconnect tubing to tank and securely plug it.
3. Fasten a cable, heavy rope or chain around the tank and secure the other end to a pole, building or substantial structure to prevent the tank from floating away.
4. Once the flood waters have gone down, call a propane installer to have the tank properly and safely re-installed and connected to the appliance for which it is a fuel source. Do not attempt to do the re-connection yourself.

OIL FIRED EQUIPMENT

As in the case of gas appliances, all work in preparing for a flood should be carried out by a professional. If this is not possible, here are some steps you may take to protect your home and property.

1. Shut off electrical supply to all equipment and leave it off.
2. Remove the oil burner and ignition transformer, or, if possible, remove the entire burner unit. If the complete burner unit is removed, cap the copper oil fuel line to ensure it is water tight. Turn off the fuel line at the tank.
3. For forced air furnaces, remove the fan motor and the fan unit if possible.
4. On hot water boilers equipped with a circulating pump, remove the pump motor, but do not attempt to remove the pump from the piping system.
5. Remove the controls for the stack, high limit and fan.
6. If the height of the flood waters exceeds the top of the tank, damage may result as the floating tank exerts pressure on floor joists and components to the building above. To prevent this consider the following:
   a. Remove oil level gauge and plug opening with the proper sized threaded plug.
   b. Fill the tank with oil.
   c. Place at least 136 kgs of weight on top of the tank. Sand bags are ideal. If the tank is only half filled, a minimum of 544 kgs of sand bags will be required.
   d. As previously noted, shut off valve at the base of the tank.

After the flood waters have subsided, do not attempt to return these appliances to operation. Such work must be done by a licensed oil burner installer.

IF YOU MUST LEAVE YOUR HOME

If rising flood waters threaten the safety of you and your family and you must evacuate your home, here are some things you may wish to consider:

1. Ensure that each member of your family has warm clothing and waterproof outerwear.
2. Take waterproof footwear for each family member.
3. Make sure each family member has at least one blanket, rolled in plastic sheeting or a plastic shopping bag.
4. Ensure each family member has identification, especially the young children. Name tags on clothing, wallet cards and wrist bands are useful.
5. Seal all personal documents and family papers in plastic.
6. Take a supply of all essential medications, especially for those on prescription drugs, for each member of the family. You should always maintain a minimum two week supply of prescription drugs.
7. Carry all items necessary for the care and feeding of any infants in the family, including diapers, feeding bottles and foods.
8. Bring hand towels and toiletry items for each person.
9. Take an AM transistor radio with extra batteries and a flashlight with extra batteries.
10. Determine a location to move to before leaving and make sure each family member knows where it is. Provide younger children with a note sealed in plastic stating the family's destination. This will reduce problems should a family be separated for any reason.

As you leave your home remember to do the following:

1. Lock all doors and windows and double check to ensure gas and other heating fuel sources are turned off, electricity is disconnected and the water is shut off at the main valve leading to the house.
2. Take extra care when driving. Familiar roads will appear drastically different when covered by flood waters.
3. Be on the lookout for damaged bridges, slides and washouts and be particularly alert for downed power lines.
4. Be alert for emergency personnel and signs providing evacuation route directions.
5. Obey officials who are directing traffic or involved in rescue or flood control operations. They are there to assist you and to make sure the situation is handled safely and effectively.

RETURNING HOME

Do not return home until emergency operations headquarters announces the emergency situation is over. Before returning make sure there is a safe water supply and adequate sewage disposal system in operation. If you are in doubt, contact the local health unit office.

If your home is in an area served by a public water supply it is quite possible safe drinking water will be available.

For detailed information concerning the potential contamination of food stuffs contact your local health unit. As a general rule, avoid possible health hazards by not eating food contaminated by (submerged in) flood waters.

Health officials recommend disposal of the following food stuffs:

NON-LIQUID FOODS, including dried fruits, cereals, flour, shortenings, spices, packaged goods, meats (fresh and cured);

CANNED GOODS (if damaged and showing signs of seepage);

BOTTLED FOOD PRODUCTS (including home preserves and home canned goods), bottled drinks (potential for contamination to gather under the rippled edge of the caps); and

LEAFY VEGETABLES.

AUTOMOBILES, TRUCKS, FARM EQUIPMENT— DIESEL OR GAS

If time allows, move all vehicles, recreational vehicles, farm equipment and other modes of transportation with gasoline or diesel engines to high ground. Flood control headquarters and the local media will provide up-to-date information concerning anticipated flood crests. If the equipment cannot be moved, then seal it as much as possible.

Some considerations include:

1. Drain all oil and replace with SAE 30, MS or DG, run engine for approximately 10 to 15 minutes.
2. Remove spark plugs and place one or two tablespoons of oil in each cylinder, re-install the plugs.
3. Remove the starter, alternator, carburetor, coil and battery.
4. Seal all openings, including distributor, carburetor, oil filter, air intake and exhaust. Use polyethylene tied tightly where possible, wooden plugs, rubber plugs or tightly wadded polyethylene.
5. Transmissions are well sealed against water, but secure any breather vents, filler tubing or air vents with plugs.
6. Cover exterior of transmission with heavy grease. Clutch plates should be left released.
7. Carry out as thorough a grease job as possible.

Once the waters have subsided the following procedure will reduce the damage caused by water intake to the engines:

1. Start the engine as soon as possible after the waters have receded and allow to run for 10 to 15 minutes, or until normal operating temperature is reached. Drain the engine oil and replace the filter. Refill with SAE 30, MS or DG. Start and run for another 10 to 15 minutes to circulate oil to all internal moving parts, drain this oil, replace filter and refill once again.
2. Remove and repack all sealed bearings.
3. Coat all exposed wear parts with a good quality multipurpose grease.
4. Have vehicle serviced by a reliable mechanic as soon as possible.

PERSONAL RESPONSIBILITY

Although there are many municipal, territorial and federal agencies ready to provide aid should a devastating flood occur in the Yukon, it is the personal responsibility of each of us to be prepared to deal with disaster should it unexpectedly strike.

Agencies from all levels of government can do their jobs more efficiently if each one of us takes personal responsibility for preparedness. Preparing ourselves, our families and being ready to help our neighbours will help to reduce the devastating effects of disasters.