Oregon Association of Municipal Recorders

and

Secretary of State Archives Division

Disaster Preparedness and Recovery Planning

A Public Records Manual

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I INTRODUCTION

A Records Disaster is an event having destructive consequences resulting in unusable records and information.

Who
This manual was developed by the Records Management Committee (RMC) of the Oregon Association of Municipal Recorders (OAMR) and the Oregon State Archives.

Purpose
The manual is a guide for preventing an avoidable records disaster and minimizing damage to public records. It covers:

- Identifying and prioritizing essential public records
- Assessing risks to city records
- Preventing records disasters
- Preventing damage to records
- Disaster response and recovery
- Salvaging damaged records

The manual addresses disasters large and small, manmade and natural. It applies to public records in all formats including paper, tapes, microform and electronic.

How the Manual Can Assist
This manual is not a "canned" or "plug and play" disaster recovery plan. However, it will assist in creating a city's Disaster Recovery Plan. A sample Policy and Plan is attached in Appendix A. Each city is unique; effective records disaster recovery programs should be tailored to each city's specific risks, missions, government structure and resources. "One size does not fit all" and engaging staff in the planning effort is, of itself, a significant benefit.

The manual does not cover life safety, damage to buildings, public order, communications, and sanitation. Responsibility and direction for these critical functions is usually found in a city's Emergency Management Plan or Business Continuity Plan.

Relationship to Other Plans
Coordination and cooperation with other city planning efforts is very important. Oregon law does not require cities to have an Emergency Preparedness Plan and/or Continuity of Operations Plan (COOP). However, Oregon Revised Statute (ORS) 401.305 does require counties to have emergency response plans and to include cities without plans in their plan.[1] It is highly recommended that cities work with their local and county emergency response agencies to integrate records management procedures into disaster recovery and COOP plans.

Records staff, emergency response, and business continuity planning staff should be involved and cross-trained in all emergency-planning processes. While these other plans

[1] Conversation with Ken Murphy, Director, Oregon Emergency Management.

frequently reference the importance of essential records, few include the planning detail needed to protect essential public records.

Involving other direct responders in records planning can have big payoffs when disaster strikes and they are already educated on the value of records and the need for a quick intervention.

This manual is designed, in part, to help cities supplement, support, and integrate records planning with their other plans.

How to Use This Manual

This manual is designed for use in a read through traditional manner or as a lookup reference.

The first eight sections provide background information, preparation activities, and a review of the planning process. Sections 9 and 10 discuss how to create and implement a plan. The Appendices contain templates, lists, forms and resources for further research.

Check out the Northeast Document Conservation Center (NEDCC) website (www.nedc.org) for excellent emergency plan templates. The center also maintains a 24-hour hotline providing telephone advice for records disasters. This service is provided at no charge thanks to a grant from the National Endowment for the Humanities (NEH).

An online video developed by OAMR and State Archives as a companion to this manual is at www.sos.state.or.us.

1 OVERVIEW

Importance of Public Records

Public records document a city's legal authority, financial status and obligations to its employees and the citizens it serves.

Loss of public records can interfere with critical services including public safety, fire and emergency services, healthcare, elections, traffic management, building and zoning regulations, programs for seniors, or utility services. City records also contain information critical for direct responders during the initial stages of a disaster.

Serious operational, financial and legal consequences can result if public records are destroyed. Loss of financial records can jeopardize a city's financial stability when it is unable to collect taxes or meet its payroll obligations.

Responsibility for the Safety of City Records

Although the State Archivist is specifically charged by statute with responsibility for the safety of all public records including those of local government, Oregon law also requires each city to implement effective procedures to protect their public records[2]. All city employees, in turn, share this responsibility.

Benefits of a Disaster Recovery Program

Disasters both large and small that damage or destroy records occur on a regular basis. Constant, sometimes conflicting demands for staff time and resources can make it difficult to find the time and money to put a records management program and a disaster recovery program in place. Because most disasters are not predictable or certain, many officials are tempted to ignore the need.

However, even if a disaster does not occur, disaster recovery plans have other benefits including:

- Increased overall security; improved general preparedness for responding to a disaster and better protection of information assets
- Increased staff awareness of records management policies and procedures
- Fewer lost records and wasted staff time searching for information

If a disaster occurs, tangible benefits of a disaster recovery program include uninterrupted city services; lower insurance costs and avoiding revenue loss from uncollectible taxes, water/sewer payments, and court fines.

Planning and properly testing a plan can provide direct responders with important information and avoid inappropriate, spur of the moment decisions. While it is impossible to eliminate all risks and hazards to public records, better decisions are made before a disaster than during one.

[2]ORS 192.001 "Policy concerning public records… the state and its political subdivisions have a responsibility to insure orderly retention and destruction of all public records, whether current or noncurrent and to insure the preservation of public records of value for administrative, legal and research purposes."

Budget Considerations

A disaster recovery program can be a lifeline during a disaster but with today's tight budgets allocating scarce resources to create a program may be a hard sell. The two most common reasons for not initiating a disaster recovery program are cost and staff time.

It is important to create a disaster recovery program to fit budgets. Even a basic disaster recovery program is better than none. Prepare an estimate of costs. Costs typically include:

- Staff time for planning and training
- Facility infrastructure (buildings)
- Office equipment (desks, chairs, shelves)
- Upgrading security
- Upgrading insurance coverage
- Offsite storage, imaging or microfilming records
- Disaster supplies and equipment
- Service contracts or retainers

A disaster recovery program can involve significant planning efforts and ongoing commitment of money and staff. It needs solid management backup. Management, when convinced that a disaster recovery program can save money in the long term, will be much more likely to allot staff time and monetary resources to the effort.

Contracting/Staffing Options

Depending on the scope of the project and available funds, consider whether to hire a consultant to manage the project. Outside consultants:

- Bring specialized expertise to the project
- May be able to write a plan more quickly than a committee of city employees
- Allow city staff more time to perform their regularly assigned duties
- May bring a fresh perspective to a situation and may have better luck overcoming turf battles that occasionally hinder projects

Compare outside help with the advantages of using staff:

- Staff have a detailed knowledge of the city and how it operates
- Staff know the records structure and uses and know each other
- Involved staff are more likely to "own" the plan and assure its implementation
- Staff will be onsite and available when the emergency occurs

Carefully weigh the cost and the need for outside expertise against the cost and expertise of staff. Consider cost sharing with other agencies.

2 IDENTIFYING ESSENTIAL RECORDS

Identifying essential records is a basic step in developing a disaster recovery program for records. This section offers guidance for the identification and prioritization of essential records and for actions to protect public records.

Policies and Procedures

Every city should have written policies and procedures for identifying and protecting essential records. The procedures should, at a minimum outline:

- Access to essential records
- Use of essential records
- Transfer and disposition of essential records
- Emergency actions
- Disaster recovery

Essential records policies should be communicated to the entire staff, included in the disaster recovery plan, periodically updated, incorporated into new employee training sessions and reviewed with staff every year.

Basic Tasks

- Use the City General Records Retention Schedule[3] to identify the city's essential records and prioritize them per their value to support critical functions
- Protect records by mirroring, duplication, backup, dispersal, off-site storage, and/or onsite secure storage

Inventory and Prioritization

There are several different ways to categorize records. Each city should consider the best system for its use. One example is defining essential records as:

- Emergency operating records needed to respond to the emergency
- Records needed within 48/72 hours for the city to perform its primary mission, to protect government and citizen legal rights and responsibilities, or to provide evidence of money paid and owed

The City General Records Retention Schedule, maintained by the State of Oregon Archives Division, is an inventory of records common to all Oregon cities. It also identifies records likely to be essential in a disaster.[4] This inventory provides an excellent starting point for classifying and prioritizing records.

[3] Oregon Administrative Rules, Chapter 166-200.

[4] OAR Chapter 166-200 "Helpful Hints (7) this schedule identifies records that may be considered essential to the city's continued operation in the event of a disaster. An asterisk follows the titles of certain record series in this schedule. Records in these series may or may not be essential to the city's operation in the immediate wake of a disaster depending on the type of disaster and the priorities and functions of the city. The asterisked record series are not exhaustive, but merely a starting point for cities identifying their essential records as part of a disaster plan. Each City should evaluate its disaster risks and its programs and priorities to properly identify all of its essential records." October 29, 2012 edition.

A detailed classification scheme could include:

Classification	Description
Critical	Emergency operating records necessary for direct responders during the emergency
Essential	Irreplaceable and unless replaced in 48/72 hours, operations cannot continue
Important	Replaceable but at great expense
Useful	Loss would cause some inconvenience but the records could be easily replaced and their loss is not a real obstacle to restoring city operations
Non-essential	Loss would present no obstacle to restoring operations

The city's legal counsel, managers and audit staff should review the list of records deemed essential. Lists should also be developed in conjunction with Emergency and Business Continuity plans to ensure the availability of records necessary to meet essential operating requirements.

Actions

1. Create an inventory of the city's public records*.
2. Note the physical or electronic location of the official copy of the records.
3. Classify the records as critical, essential, etc.
4. Prioritize records within their categories for rescue.
5. Note whether the records have duplicates or are backed up and their location.

**The General Records Retention Schedule for Oregon Cities (OAR 166-200) includes a comprehensive list of records created and maintained by Oregon cities. The schedule should be used as a basis for the inventory of your city's records.*

3 ASSESSING RISKS TO CITY RECORDS

Generally, there is not enough money to protect all records, so a decision must be made to prioritize spending for both prevention and salvage. With the record classification and inventory information in hand, the next step is to conduct a risk assessment to help make prevention and recovery decisions.

The risk assessment should include:

- Types of risks and probability of occurrence
- Types and extent of damage likely to occur
- Consequences for the city

Types of Risk

Environmental Risks

- Nature and weather-related factors such as earthquakes, floods, windstorms and humidity
- Risks to facilities including plumbing, wiring, inadequate alarm systems, heating/air conditioning systems and leaking roofs
- Mold, insects and animals

Technical Risks

- Electronic records physical hazards including power surges, static electricity, improper grounding, poor virus protection, prolonged power outage, and heat
- Inadvertent deletion of data, backup failures, improper storage for disks/tapes, and incomplete software documentation, and lack of technical knowledge

Logical Risks

- Physical security risks including building access, record access, keys, locks, alarms, improper destruction of records and release of confidential records

Data Breaches

- Unauthorized access to data

Probability and Impact

Identify disasters that have taken place within similar organizations. Consider:

- What kind of disaster took place? Fire, flood, explosion, vandalism?
- When and where did it happen?
- What was the extent of the damage?
- What is the probability of the event taking place again?
- Have measures been taken to prevent a similar incident in the future?
- What was the success rate of earlier recovery attempts?
- Were records lost?
- Were the lost records accounted for at that time?
- What did it cost to recover the records?
- What was the cost and impact of the lost records?

Risk Assessment

With this information in hand, the next step is to conduct a formal risk assessment. The purpose of the risk assessment is to rank the potential disasters for the probability that each will occur and to estimate the consequences of the likely damage.

The Archives and Record Management Division of the Washington Office of Secretary of State[5] has developed a simple tool for a functional analysis or Risk Assessment. The city's risk manager or insurance carrier may have other risk tools.

Risk Assessment				
		A	**B**	**C**
#	**Function**	**Probability of Disaster 0-5**	**Consequences of Disaster 0-5**	**Risk Number (C=A x B)**
1	Accounts Receivable	3	5	15
2	Accounts Payable	4	5	20
3	Payroll Records	1	5	5
4	Police Incident Reports	2	4	8
5	Working Files	5	1	5

Each line in the example represents a city function. The functions may generate one or more records series/or information systems. Each department is asked to list its major functions. For each function set a "probability number" between 0 and 5 for the **likelihood** of a disaster and a number between 0 and 5 ranking the **severity** of the consequences of damage to these records. "0" is low and "5" is high.

In the example above, Police Incident Reports ranks "8" because the probability of a disaster has been ranked low (2) even though the consequences would be ranked high (4).

These or a similar ranking scale will be a valuable guide for developing an essential records program and writing a disaster recovery plan.

Actions

1. Make a list of potential disasters.
2. Estimate the probability of a disaster occurring.
3. Identify the damage and estimate the consequences to the city's records.
4. Complete the assessment by determining the "risk number".

[5] www.wa.gov/archives/recordsmanagement/disasterpreparednessandrecovery.aspx

4 PREVENTING A RECORDS DISASTER

Some disasters are unpredictable and beyond our control to prevent. Good storage practices can help offset the impacts a disaster can have on records.

Storage Practices

OAR 166-020-0015 and Oregon statewide standards for record storage. A summary of requirements follows:

- Fire-resistant structures
- Temperature and humidity maintained at the levels to ensure longevity of the paper, film, or tape on which they are recorded
- Adequate light and access for retrieval
- Adequate ventilation and protection against insect or mold invasion
- Safe distances from steam, water and sewer pipes
- No public records of enduring value should be stored where heat, breaks, drips, or condensation from pipes could damage them; where windows, doors, walls or roofs are likely to admit moisture; or where they will be exposed to sunlight or extreme temperature variations
- Aisle space free of obstruction
- Records not stacked or piled directly on the floor
- Records shelved above the initial flood level of any bursting pipe, leaky roof, sprinkler system, or other source of water

The OAR addresses public records stored in electronic format in OAR 166, Division 17, and in microforms in OAR 166, Division 25.

ARMA International and NAGARA are excellent sources for publications on records storage[6]. All areas where records are stored should comply with the state standards.

Physical Inspection

Conduct a physical, common sense inspection of buildings with the city's safety committee and managers for records, facilities and security. Fire and police departments and risk management staff or insurance carriers are also good sources to include. An annual audit can assist with assessment of records storage.

- Physically inspect buildings for problems or violations of storage standards.
- Prepare a list of potential hazards.[7]
- Identify actions needed to minimize or fix the problem.
- Follow-up to assure the problem is fixed.
- Repeat the inspections and update periodically.

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[6] ARMA is a nonprofit professional association and the authority on managing records and information – paper and electronic. Their website is www.arma.org. NAGARA, the National Association of Government Archives and Records Administrators, is an association dedicated to the improvement of federal, state, and local government records and information management. Their website is www.nagara.org.

[7] Look for frayed extension cords, tall shelving units located near employees' workspaces, oily rags in the janitorial closet, a sump pump clogged with leaves, record boxes stored on the floor instead of on shelves and pallets, or filing cabinets housing essential records located underneath water pipes.

Good housekeeping, constant monitoring and prompt elimination of fire and water hazards are important. Water damage can be a common hazard. Key conditions in the storage areas should be regularly monitored. Best practices also include the following standards or actions:

Climate

- Ideally, temperature should be a constant 65 degrees with a relative humidity of 45 percent, with daily fluctuations in temperature and humidity no greater than +/- 5 degrees and +/- 5%[8].

Water

- Fix roof and pipe leaks immediately.
- Store records at least eighteen inches from ceilings, suspended lights or from sprinkler heads, and at least three inches off the floor. If a room does not have sprinklers, records must be twenty-four inches from the ceiling per Fire Marshal standards (see Oregon Structural Specialty Code, Section 315.1). If you cannot afford shelving use a wooden pallet which will give you the three-inch floor clearance.
- A water-sensing device connected to the building's security system is recommended to monitor conditions when the building is not occupied.

Hygiene

- Prohibit eating and drinking while working with records.
- Deal with signs of rodents or insects immediately.
- Do not allow trash to accumulate.
- Do not use records storage areas for surplus storage.

Fire

- Do not store records in contact with electrical or fire alarm systems or where they will obstruct exits, access panels, air conditioning ducts, or fire extinguishers.
- Prohibit all smoking and keep flammable solvents out of the records storage area.
- Do not overload electrical outlets or use extension cords on a permanent basis.
- If used temporarily, extension cords should be heavy duty.
- Train employees to know location and use of fire extinguishers.
- Design and post throughout the facility an escape route map.

Vandalism and Theft

- Limit access to the records or storage areas.
- Collect keys and access cards at employee termination.
- Perform routine maintenance on alarms, intrusion detection and access systems.
- Keep building exteriors well-lit and make security checks at closing to assure doors and windows are locked, faucets and appliances are off and no unauthorized personnel are in the building.
- Have procedures in place for theft or vandalism.

[8] Standard set by the National Archives for archival materials.

5 PROTECTING RECORDS FROM HARM

Deciding ***how*** to protect the city's valuable information in public records should be based in part, on a cost-benefit analysis. Choose options that balance the cost of protection with the degree of risk and the severity or consequences of losing the information.

To help determine the amount of protection to provide for each type of record use the following:

- The prioritized list of records from the essential records inventory
- The list of likely disasters and records damage from the city's risk assessment
- A matrix of prevention options and their costs

The three most common methods of protecting essential records are:

- Duplication and dispersal
- On-site secure storage
- Off-site secure storage

Duplication and Dispersal

The reason for making duplicate copies of essential records, which are then dispersed to offsite or safe onsite locations, is simply that it increases the probability that one copy will survive if the other copy is destroyed.

The two basic processes for duplicating records are:

- Preparing extra copies when the record is created
- Reproducing existing records for the sole purpose of protection

The primary methods of duplicating records are:

- Photocopying
- Microfilming
- Copying to magnetic tape or disk storage
- Imaging, scanning or printing
- Electronically stored with off-site vendor

There are two methods for dispersal of copies:

1. *Routine dispersal* is the placement of duplicate copies in a second or multiple locations for normal business needs. Some essential records are automatically dispersed through normal operating procedures; for example, information copies sent to branch offices or documents filed with other offices or agencies.

   State agencies often receive files of city documents to meet various requirements. Protection of essential records by routine dispersal is usually inexpensive but can be very unreliable.

   When using routine dispersal for protection of essential records:

   - Notify the offices or agencies of the use
   - Arrange for retention and protection requirements
   - Requisition any equipment necessary to make the information available, such as a computer, microfilm reader or printer if needed

- Audit or routinely verify that the records are being retained

Although it may not be advisable to rely on these protection copies for disaster recovery of the most essential records, routine dispersal can be a cost-effective disaster recovery option for many records.

2. *Planned dispersal* occurs when duplicate records are stored solely for protection. Copies are sent to an essential records depository or other location for security. At the outset of an essential records program, it may be necessary to duplicate all the existing documents designated as essential. Planned dispersal tends to be more costly than routine dispersal but is more reliable.

NOTE: Both routine and planned dispersal will result in unnecessary copies of information being retained and may result in increased storage costs and liability for retaining records past their scheduled retention period. If dispersal is the method chosen, regular audits of these copies must be done and unnecessary records destroyed as they are replaced with more current records.

On-Site Secure Storage

Fire Vaults, fireproof safes, file rooms with fire doors and walls and fire-resistant cabinets and containers provide varying degrees of protection for essential records. They can be in or near the office area.

Evaluate the convenience of having the records close, the risks associated with the loss of information and the cost before investing in these on-site storage options:

- Fire Vaults are very expensive to build but may be justified if the volume of records is high or the records require this level of protection. In buildings with a high risk of fire, a fire vault may be the only way to protect records. The vault must be a concrete or similar, non-flammable structure and include a fire rated door. Standard fire vault doors come with 2-, 4- and 6- hour ratings, which means the vault is fire resistant for 2, 4, or 6 hours. Be sure to check vendor specifications, certifications and warranties to determine the actual fire rating. However, they are not waterproof and contents are vulnerable to water damage.
- Fireproof safes are useful for small volumes of records and for locating the records close to the point of use. They are less expensive but do not provide as much protection as fire vaults. Some will resist fire for up to 4 hours. Again, be sure to check vendor specifications, certifications and warranties to determine the actual fire rating.

Off-Site Secure Storage

Generally, off-site storage facilities provide more security and protection than original records have at their primary site.

Off-site storage usually costs less than active storage space providing economical storage for records that are seldom used. Central off-site storage also simplifies access, unlike other dispersal techniques where essential records may be distributed to many off-site locations. Also, it is unlikely that an off-site storage facility will be affected by the same disaster that occurs to duplicate records in the primary building.

Factors to consider when deciding to store essential records in a remote location:

- The facility should be located away from rivers, geological faults, coasts, volcanoes, manmade structures or other high-risk areas that might pose a threat.
- The facility should be accessible to authorized personnel, 24 hours a day, 7 days a week.
- Carefully evaluate fire safety, atmospheric conditions, pest control, security and technical services.
- Decide if a communication link between the office and remote facility is necessary.
- Options for off-site storage include city-owned storage, commercial records centers and cooperative city records centers.

The decision of how to protect essential records should be made primarily based on cost-effectiveness. Since relative security is all that can be expected, the best choice is the one that most effectively balances the cost of protection, the degree of risk and extent of damage.

Storage - Security Copy Depository

Security copies of microfilmed essential records may also be stored in the Oregon State Archives Security Copy Depository. The Security Copy Depository offers a temperature and humidity-controlled vault especially designed for the medium and long-term storage of microfilm.

Special Considerations - Electronic Records Protection

Although many of the processes described above can apply to electronic records, there are special protections needed for essential records stored in e-mail systems, servers and networks. A disaster recovery plan for electronic records should include data recovery, hardware, software and the expertise to operate it. City Information Technology staff must be involved in creating the plan.

Generally, system backups are relied on for data recovery. It is important to note that system backups done for security are not adequate to meet retention requirements[9]. Check with Information Technology staff to determine the type of backups and their frequency and storage practices.

- Restoration and backup schedules for essential records should correspond to the city's need for those records in any potential disaster.
- The city's information system disaster recovery, business continuity plan and emergency operations plan must be coordinated to address essential electronic records.
- Either duplicate information or perform daily backups of computer systems containing essential records.
- Store backup tapes and disks off-site in a secure vault-type environment.

[9] Back up tapes made for security or restoration typically are written over periodically. Normally, the Information Technology Department performs backups of both systems and data; partial backups for new data are usually performed daily with a complete backup done weekly. These backups usually do not capture information that has been deleted from active use and are not intended to meet retention requirements.

Other protection measures are worth exploring and may be necessary to meet a city's required service level for essential electronic records. These methods allow records to be restored more easily and quickly in a disaster.

- Electronic vaulting, which is sending data to another server, usually operated by a commercial vendor.
- Data replication, such as mirroring and shadowing[10], which are methods of data duplication.
- Hot, warm or cold recovery site[11] which is a backup site at another location where computer systems can easily relocate following a disaster.
- Cloud storage[12].

Actions

1. Determine how each series of essential records will be protected and add this information to the plan.
2. List storage and duplicate techniques for each essential record group.
3. List the city's electronic records and their backup plans.

[10]In data storage, data mirroring and file shadowing is creating a direct copy of the data set. It is the replication of logical disk volumes onto separate logical disk volumes in real time to ensure continuous availability, currency and accuracy.

[11] A hot site is a duplication of the original site with full computer systems as well as complete backups of user data. Hot sites are the most expensive but have minimal downtime. A warm site has duplicate computer hardware and network connections established but it will take time to become operational and to have the back-up information loaded. A cold site has little or no hardware set-up and backed-up information needs to be sent. This is the least expensive option but takes the most time to become operational.

[12] Cloud storage is only an option if an agreement is in place with the cloud provider to retain information to the refresh rate established in the Disaster Plan.

6 PLANNING FOR RECORDS RECOVERY AND SALVAGE

Planning, preparation and staff training are the best way to avoid record disasters and to mitigate their effects. Essential records protection and preventative measures make salvage of damaged records faster and more effective.

This section provides direct responders guidance for creating an action plan to save and salvage records when a disaster has occurred. Disaster response and recovery procedures are the steps taken from the time a disaster situation is detected to the time when records are packed out, dried or otherwise salvaged and restored to use. As a standard approach, the recovery team should:

- Stabilize the site and records
- Assess and document the damage
- Create a detailed action plan

Stabilize the Building

Actions to save or salvage records should begin as soon as possible after a building official or fire marshal determines the building is stable and they have given their approval to enter the building. The priority is to ensure the safety of people.

Gain Access

The fire marshal, building security, safety officer, or other public official in charge of the building will declare when it is safe for entry into the building. The recovery team coordinator will respect their decision. However, it can be very helpful for the recovery team coordinator and the responsible access authority to reach an agreement ahead of time about the value of the records and the need for quick access and fast response.

Actions that may be needed:

- Document the damage.
- Work through proper authorities such as local public health departments and HAZMAT units to determine if the clean-up of sewage, biological agents, chemicals and other contaminants is completed.
- Shut off, repair and restore utilities.
- Stabilize leaning or collapsed shelving.
- Remove mud, water, ceiling tiles, broken glass, and other debris.

Security Measures

The facilities manager or other personnel should secure the site. Special security personnel may be required if the security system has been damaged, if doors or windows are damaged, or if the facility is not substantially intact. Other actions that may be needed:

- Replace doors and windows.
- Allow only authorized persons to enter the site.
- Immediately report all unauthorized persons in the disaster area to the supervisor or security officer.

Usually, the next step is to restore environmental controls to provide a cool, dry climate in the affected area.

- If the heating or air-conditioning system is operable, adjust the settings to provide maximum cooling and dehumidification. The goal is to maintain the temperature below 65 degrees and the relative humidity below 45 percent, with the system running 24 hours per day.
- Use oscillating fans to circulate air if the heating/air-conditioning system is not working. Stagnant humid air leads to mold growth.
- Monitor the temperature and humidity levels at least every four hours to measure progress.

Stabilize the Records

In a water disaster recovery effort speed is of the essence because paper wicks water. Wet records must be salvaged within 48-72 hours of the disaster to avoid costly restoration efforts.[13] Photographic materials, electronic or magnetic media and coated stock paper deteriorate more quickly and should be given the highest salvage priority. If stabilization is not possible, paper records must be moved off-site.

Document the Damage

Once it is safe to enter the building, the recovery coordinator, photographer and other recovery members should photograph or document the damage for use in making a detailed assessment of the damage. Check with your risk manager or state/ federal emergency management agencies for required documentation.

Appendix A contains examples of an Initial Damage Assessment Report which may be used to document damage and to determine the type and extent of the disaster.

Assess the Damage

The next step is to determine the scope of the recovery effort needed. Appendix A contains a Detailed Disaster Recovery Worksheet that may be used to record the information listed below.

- Determine the type and extent of damage and the approximate volume of records affected.
- Assign recovery priority per the disaster recovery plan for essential records.
- Determine which records are official copies and on vulnerable media that have not been backed up.
- Confirm the existence of duplicate records.
- Throw out replaceable or disposable materials to reduce the volume of materials confronting the recovery team and to remove a source of humidity from the disaster area.
- Keep an inventory of discards for insurance, replacement and tracking.

For further information, refer to the “Salvage at a Glance” table, which identifies the material, priority, handling precautions, packing method and drying method for each type of record media. In addition, the “Drying Techniques for Water-Damaged Books and

[13]The actual amount of time depends on temperature and humidity levels at the disaster site. Higher temperatures and humidity hasten the deterioration of the storage media – within 60-72 hours bacterial and fungal growth are likely to develop.

Records" table provides information about specific drying techniques and the intended results. The Northeast Document Conservation Center[14] provides a 24-hour hot line to respond to disasters that are paper based.

Develop a Salvage Plan

Once the recovery team has reviewed the extent of damage, determined the status of building systems and the availability of personnel, a plan of action should be developed addressing major issues in the disaster recovery plan.

If damage is extensive, the salvage plan may require decisions on what records to salvage based on value, extent of damage and whether they are duplicated elsewhere. To help make the decision:

- Determine the kind and degree of damage that records in each location have sustained[15].
- Document all decisions for insurance and public disclosure purposes.
- Verify availability of backup records. The damaged records should be discarded after listing record titles and the reason for their disposition.
- In a large-scale disaster, decide which recovery operations to handle with existing staff and which to contract to disaster recovery companies.
- The cost of cleaning or reconditioning micrographics or magnetic media may be excessive. The appropriate method for protecting such records is to back them up regularly.

Other Decisions Needed

After a salvage plan has been developed these additional decisions are made:

- Determine which materials to salvage and which to discard.
- Decide if the recovery team or staff will handle the salvage operation, or whether some or all of it should be contracted to disaster recovery specialists.
- Decide what drying and other recovery methods to employ and what resources to mobilize.
- Recovery operations for records to be air dried locally differ from those that are appropriate for records to be sent to a drying facility.

Supplies and Services

The recovery team should determine what supplies and services are required for the recovery operations. Suppliers and service providers including temporary employment agencies should be listed in the disaster recovery plan and if practical when the disaster is anticipated, notified in advance of a disaster. Consult with the city procurement officer if needed.

Salvage - Water Damage

Time is of the essence when dealing with water damage:

- Remove all standing water; a wet vacuum may be used.

[14] Phone number: (855) 245-8303. Website: http://www.nedcc.org/

[15] These will be general designations, depending on the extent of the disaster, on a range-by-range, cabinet-by-cabinet, or room-by-room basis. Use a scale for rating degree of damage, i.e., Level 1 to 5, with Level 1 indicating minor or no damage and Level 5 indicating extreme damage.

- Reduce the temperature and humidity and increase air circulation by turning on air-conditioning or lowering the temperature setting.
- Measure the temperature and relative humidity using monitoring devices which should be available in the supply kit.
- Increase air circulation in the affected area by running fans continuously.
- Records damaged by water can be stabilized by freezing.

Initiate response procedures and instructions on an appropriate scale. A rule-of-thumb is if the quantity of damaged materials is less than 50 volumes or three file drawers, materials can be recovered in-house using air-drying techniques.

If there are more than 50 volumes, decide whether to freeze and then air-dry them in small batches or call in a vendor that provides drying services.

Salvage - Mold and Mildew

The onset of mold is a concern during salvage and is a health and safety issue[16]. Workers should wear protective masks or respirators and disposable gloves when working with records containing mold. Do not proceed once negative health effects are observed no matter how minor they appear. Wash protective clothing in hot water and bleach.

Ordinary dust masks are not sensitive enough to filter mold spores: use a respirator with a HEPA filter. Be aware that respirators are ineffective if used improperly. For example, facial hair can prevent a proper seal.

Mold grows in areas with high temperature, high relative humidity, and low air circulation. Spores of fungi, mold and mildew are found almost everywhere. They only require the proper conditions of moisture, temperature, nutrients and sometimes light to proliferate. Absence of visible growth at low temperatures does not indicate the spores are dead. Media such as paper, cloth, leather and adhesives may be consumed or stained by many types of mold.

Requirements for mold growth include:

- Moisture – at least 70 percent relative humidity
- Temperature – if it is comfortable for humans, it is great for mold
- Food source – mold eats anything organic (paper is a delicacy)
- Time – growth can begin in 48 hours if conditions are right

Recognizing mold:

- Musty smell resulting from digestive process
- Colored spots on paper - early stage
- Holes eaten in paper - advanced stage
- White or beige powder - usually a sign of dead mold (does not mean material is free of live mold or dormant mold spores)

Isolate moldy record materials in a cool, dry location, with plenty of air circulation so they will not contaminate nearby items; do not return the records to their original location until the conditions causing the mold growth are addressed.

[16] Oregon Occupational Health and Safety Division has rules about chemical hazards and Personal Protection Equipment including the respirators.

Once records are removed to a less hospitable environment, the mold will become loose and powdery as the substrate dries and the mold turns dormant. It may then be gently brushed off. Because the mold is merely dormant, if it remains or is distributed throughout the space and onto other objects, it will grow if environmental conditions are favorable.

Mold removal should be performed outdoors or with a vacuum cleaner equipped with a HEPA filter; regular vacuum cleaners will merely exhaust and recirculate mold back into the room. Fans should be used carefully and only when their use will not circulate spores.

Ideally, the faster record materials are dried the better. However, some record materials may distort physically if dried too quickly. Contact a preservation professional for advice on how to handle moldy record materials of high value. The American Institute for Conservation's (AIC) Guidelines for Selecting a Conservator (see Appendix D) maintains a referral list. www.conservation-us.org/membership/find-a-conservator

Methods to destroy mold:

- Dehumidification
- Fumigation
- Freeze drying
- Vacuum fumigation or vacuum drying

If the outbreak is small, separate moldy items from those not affected by either moving them to a well-ventilated location or using tarps for walls. Use fans to increase air circulation, readjust the HVAC system or use dehumidifiers to lower the relative humidity. If possible, vent to the outside.

For large outbreaks, freeze the collections. Placing the moldy items in an atmosphere of below freezing temperatures will halt growth but will not kill spores. Collections can then be removed and cleaned.

Clean the storage area. Begin by vacuuming the area with a HEPA filtered vacuum. Shelves, floors, walls, ceilings and windows should be cleaned with a mold and mildew killing solution. Ducts and air conditioning systems will also need to be assessed for the presence of mold and may need replacing.

If the outbreak is too large for local staff to handle, call a vendor that specializes in mold remediation. If the records are essential and must be salvaged, consult a conservator or preservation specialist before dealing with severely affected materials.

Two excellent resources are the Northeast Document Conservation Center Hotline[17] and the National Archives publication at www.archives.gov/preservation/holdings-maintenance/mold.html.

Actions

1. Make a list of elements and actions needed for a salvage operation.
2. Prepare an outline for writing a salvage plan for the city.

[17] Phone number: (855) 245-8303. Website: http://www.nedcc.org/

7 IMPLEMENTING THE SALVAGE PLAN

Establish an Operations Center

In a routine emergency where the building is intact operations will usually be directed and coordinated through the recovery coordinator's office. Off-site space may be required for recovery activities including sorting, packing and if necessary, drying. Off-site space may also be needed for a large disaster. Any alternative site should be identified in the disaster recovery plan. Set up the recovery area with the following recommendations:

- Large enough to fit several tables
- Well lit
- Good air circulation
- Securable with locks
- Access to clean running water
- Electricity with outlets for computers, fans, etc.
- Environmental controls for temperature and humidity
- Set up fans to circulate air

If records will be shipped off-site or to a contractor for recovery, a staging area will need to be established where records can be boxed or re-boxed, recorded in a tracking system, and prepared for shipment/delivery/pick-up. Necessary items for the staging area include:

- Tables, supplies, and shelves
- Tracking system, boxing, and loading records
- Space for staff to move about
- Accessibility to trucks

If the emergency is large-scale or there is not access to suitable areas onsite, locate an appropriate facility elsewhere, such as:

- Public buildings such as armories or schools
- Buildings with private meeting facilities
- Church activity buildings
- Commercial property for rent or lease
- Rental trailers or tents

Determine Personnel Needs

Use the Disaster Preparedness and Recovery Plan and the Recovery Team Responsibilities templates in the appendices to call in needed staff. The following also may be called to help:

- Supplementary city personnel
- Volunteers
- Temporary help

Below is the work flow process to follow in the event of a water disaster. Similar processes are taken for other types of disasters although the individual steps may vary based on the type of disaster.

Removing Records

Not all records disasters will be due to water damage. Records could also be exposed to

contaminants such as powder, fire suppressant or other chemicals. Before removing materials assess the safety of processing the records without specialized assistance.

If a full range of recovery services is available, it is generally appropriate to begin with the wettest or most contaminated materials and move to those that are merely damp or have had less exposure. However, if the organization is limited to air-drying and using staff resources, it may be better to begin with those that are least damaged and therefore most quickly recovered. Consider:

- Hiring a restoration company to handle affected records.
- Moving undamaged records to a warehouse, city or commercial records center or rented space that has a suitable environment.
- Activating agreements for the use of cold storage and warehouse space made as part of the Disaster Recovery Plan or ask the city purchasing officer to secure space for both damaged and undamaged records.
- Removing records from affected areas for immediate drying to a cleaning or recovery area within the organization, or transport to a freezer facility or commercial drying facility. Freezing records is a good option if all wet records cannot be treated within 48 hours. Freezer choices range from a trailer to a chest. Consider alternate resources such as store freezers, local universities, colleges, food banks, etc.

Organizing the Pack-Out

The recovery plan should contain a “pack-out operation” section executed in the order determined by the recovery coordinator. “Pack-out” is a process in which damaged records are identified, labeled, and moved off site. Do not begin until the staging and/or recovery area is prepared. Depending on the nature and extent of the damage, available help and possible logistical constraints, work crews in the pack-out operation will consist of people assigned to the following tasks:

- Pack-out leader: ensures smooth workflow, alleviates bottlenecks and troubleshoots
- Box assembly: sets up boxes, list, supplies
- Retrieval: removes materials from shelves, cabinets, floor, etc.
- Wrapping: cuts freezer/waxed paper needed for bound materials
- Packing: takes items from retrieval and wrapping and boxes them
- Sealing: seals and working in concert with record keeper, labels containers
- Record keeper: keeps a written packing list
- Transporting: moves containers from packing area to pallet, elevator, stairs, etc.

Box Packing for Pack Out/Removal

Pack-out procedures for wet records vary and are based on whether materials are being transported to a nearby area for immediate drying or to an off-site cold storage or freeze-drying facility. The latter requires more careful packing and more thorough documentation. Different recovery methods may mean different packing out practices and supplies.

Commercial records recovery services will probably recommend and sell appropriate containers. Use the following when “on your own” or using a service that does not have specific container requirements:

- To move materials within the building during pack-out use hand trucks, utility carts or dollies. Metal hand trucks and utility carts are preferable.
- Sort and pack like materials together, e.g., soaked records or volumes in one box and merely moist ones in another.

Options for other receptacles include:

- Clean, dry cardboard or plastic boxes
- Plastic crates lined with garbage bags or “Rescubes” (light weight plastic reusable archives boxes with vents and able to withstand weight of stacked boxes)
- Plastic garbage bags (one box per bag)

Paper Files

Place the folders vertically in boxes or crates standing as they would in a file drawer *(Note: Plastic crates are useful and do not wick water)*. Do not allow the folders to slump or slide down within the box. Do not fill boxes completely because they may swell and should not be stacked more than four boxes high.

Bound Volumes

Load into boxes for transport. Place normal-size volumes in a "spine down" position. Pack large volumes flat in the boxes. If time allows, loosely place sheets of freezer paper or waxed paper around every, or every other volume. Enough space should remain in the packed boxes to allow for swelling. Do not permit volumes to become bent or distorted in packing or transport.

Microforms

Place in cool, clean water until ready to transport for reprocessing.

Photographic Materials

Most photos can be left in cool, clean water for a few hours until ready to dry or send for reprocessing.

The boxes of the above materials can be stacked on pallets and the pallets can be shrink-wrapped to prevent slippage during transportation. Pallet jacks or a forklift can be used to move the pallets onto trucks or to the drying area.

Labeling

At a minimum, each box or crate should be labeled with a control number and this information recorded in a database or box listing sheet. Labeling may be more comprehensive and include inventory information such as:

- Original location (shelf or file name/number range or cabinet/drawer)
- Records series and title or brief notation of contents
- Content dates
- Office location
- Salvage priority
- The number of volumes or boxes
- Indicate the damage assessment "wet," "dry," "smoke," or "mud"
- The destination of each container if materials are going to different areas (i.e. rinsing stations, air-drying area, freezer, etc.)

Use waterproof markers or pencils to label boxes and use plastic tags for plastic crates. Enter the information into a spreadsheet, an inventory form or packing list.

Tracking System
Note the condition and disposition of records for inventory control and insurance, especially if they are being transferred to a restoration service provider. Prepare a list of records and identify which were:

- Destroyed in the disaster
- Removed or replaced
- Sustained only minor damage
- Damaged but salvageable

Identification for Tracking
For tracking purposes, each box or drawer of records removed must be identified by a unique number or code. Make sure all containers are labeled on two sides using waterproof permanent markers.

Document Decisions
Throughout the salvage operation, it is useful to document any decisions made about the records, particularly decisions to discard records and who authorized the destruction. Staff or an assigned photographer shall take photographs or videotape the salvage operations to document the recovery effort. Keep cameras available.

Stacking Pallets for Transport
Records sent off site are normally shipped in freezer trucks on pallets that have been shrink-wrapped. There are several systems for stacking pallets for transport. One system involves stacking the boxes in an alternating pattern (like bricks). This allows each level to stabilize the one below and uses the strength of the box walls to support the weight of the uppermost boxes. Before moving wet records, always repack materials in boxes or containers strong enough to hold their weight.

Removal
Use elevators if conditions permit their safe use. Other removal options include:

- Using a "human chain"
- Laying plywood on stairs as ramps for sliding boxes down
- Sliding boxes out windows onto ramps
- Removing boxes through windows

Destruction
Keep a log of records destroyed and who authorized the destruction.

Actions
1. Make a list of resources and actions needed for a salvage operation.
2. Prepare an outline for writing a salvage plan at the time of the disaster.
3. Provide cameras for documenting damage.

8 POST RECOVERY

Post-Disaster Restoration
Further restoration work may be required after the records have been returned or recovered and before the records can be re-filed, re-shelved or returned to other storage locations.

Repairs
All repairs of permanent, historical and intrinsically valuable records should be made using only reversible and non-damaging archival treatments**.** For example, adhesive tape should not be used since many types of tape contain chemicals harmful to paper and can be difficult and expensive to remove. Professional paper conservators should be employed for this purpose, or at least consulted, unless a member of the staff or volunteer is technically trained for this work. Close behind tape in its destructive effect is the practice of lamination. Lamination does not lengthen the natural life of paper and its sticky plastic is virtually impossible to remove. Lamination should not be confused with the professional practice of "encapsulation." Encapsulated documents are placed between two sheets of inert plastic; the "sandwich" that is created is sealed only around the edges, thus the document is not attached to the plastic in any way.[18]

Storage
Prepare the shelves. Shelves that have held wet records should be sanitized before the records are re-shelved. Wash shelves and floor in affected area with a weak solution of sodium hypochlorite (common bleach). Dilute 1 gallon of water with ¾ cup of bleach. An even more effective treatment is quaternary ammonium compounds, available under a variety of brand names. Records that have been water-damaged or mold-infested should be kept apart from other records for at least six months in a well-ventilated area with good climate control which is 65 degrees Fahrenheit and 35-45 percent relative humidity.[19]

Disposal
Specify who has legal authority to order the destruction of records, what record keeping must be done and where or how records will be discarded. If you are unsure as to the requirements relating to records destruction, contact the City Clerk/Recorder or the Oregon State Archives Division for guidance.

Actions
1. Hold a debriefing meeting for participants.
2. Create a list of “Lessons Learned.”
3. Revise disaster recovery plan and procedures as warranted.

[18] http://clarke.cmich.edu/resource_tab/professional_advice_and_community_resources/preserving_memories/preserving_memories_index.html
[19] See Oregon Administrative Rule (OAR) 166-020 -0015 and -045, http://arcweb.sos.state.or.us/pages/rules/oars_100/oar_166/166_020.html

9 CREATING THE PLAN

Previous sections in this manual covered background information and activities relating to a Disaster Recovery Plan. This section provides guidance on how to create and write the plan. The written plan should follow a logical sequence and employ a format that is easy to understand.

The plan should include lists of resources, activities and salvage priorities ready to use when a disaster strikes. The planning process itself provides a valuable forum for decision making. Benefits from the planning process include:

- Higher level awareness by staff, management, direct responders, risk managers, police and fire departments to the need of recovery and salvage of essential records
- Pre-arranged and positioned support and resources
- Assembled and pre-positioned disaster recovery equipment and supplies
- Trained recovery team members
- Periodically tested and thus improved plans and procedures

The Planning Team

Successful creation and implementation relies heavily on teamwork and collaboration; incorporating employees from every department will facilitate development of a more comprehensive plan. It is also important to include reliable people on the planning team who work well under pressure and in potentially adverse conditions. Members should have knowledge of the organization's major functions and departmental relationships. All planning team members should have designated backups.

Staff to consider as members of the team or to consult with are:

- City departments records officers
- Department managers
- Information technology staff
- Risk management staff and the city’s insurance underwriter
- Legal counsel
- Facilities or maintenance staff
- Security staff
- Emergency operations personnel

Common functions of the planning team are to:

- Assist and advise the planning team leader in selling the plan to management and other staff
- Conduct the risk assessment
- Help prepare and prioritize the essential records inventory
- Write the plan
- Train staff and test the plan
- Respond to the emergency
- Conduct recovery activities

The plan should be a generalized or strategic plan with probable response and recovery

procedures for each type of damage. Flexibility is critical and decisions often immediate. Procedures, alternative courses of action and tactical responses will depend on each disaster. A tactical plan should be developed and adopted at the time of the disaster to conform to the specific event.

Writing the Plan

Standardization is important particularly if several people are contributing to the document. The heading format and use of bullets and numbering offer consistency to the reader. Bullet points and checklists can be more effective than a paragraph. It is best to organize the plan in a simple way so that information can be accessed quickly in a crisis.

Use short, direct sentences and paragraphs to facilitate quick understanding and action in a crisis. Avoid jargon and acronyms. Present one idea at a time so people can check off what they have completed.

Use position titles instead of names to avoid updating the plan for personnel changes.

A useful resource in writing a plan is a free online tool called dPlan[20].

This service provides templates for entering City information that generates a disaster plan specific to the user. dPlan stores this information on their server for future use. The template guides, drop down menus, and links to technical assistance are helpful.

PLAN COMPONENTS

1. **Policy Statement**
   Ideally, a policy statement contains:
   - Clear and direct authority from top management for the plan
   - Delegation of authority for decision-making during and after a disaster
   - A list of staff authorized to commit funds and contract for services before, during and after a disaster
   - A statement of specific goals and objectives of the plan
   - Directions for staff with a description of what is expected of them
2. **Authority**
   This section of the plan should:
   - Identify criteria for determining when a disaster exists
   - Have an explicit delegation of authority to a staff member who reports directly to the city administrator to declare an emergency and declare the plan in effect
   - Delegate authority to assign recovery teams
   - Have an emergency contact list with staff and other emergency phone numbers
   - Contain a procedure for contacting recovery team members, support agencies and vendors, suppliers and consultants
   - Designate a spokesperson to collect and brief the media and employees with up-to-date, reliable information

[20] dPlan™ copyright © 2006 by Northeast Document Conservation Center. Used by permission. www.dplan.org.

3. Communication Component

Effective communication is critical in a disaster. The plan should include a written description of the roles of employees when responding to an emergency and the names of the employees with decision-making authority in the event of a records disaster. The communication section should also:

- Identify a designated spokesperson to speak with the press (may vary based on the situation).
- Identify the command post and where staff should report.
- Establish ways to communicate information between recovery team members. If phone service or computers are not available, consider "runners" to deliver written messages. Do not rely on verbal messages.

4. Essential Records Inventory

Essential records, sometimes called vital records, are the records necessary for the continuity of operations during and following a disaster. They are records a city must have to maintain one or more of the following essential functions:

- Document the city's legal authorities, rights, and responsibilities (ordinances, resolutions, minutes, rules and regulations, etc.)
- Resume or maintain operations in a disaster or emergency
- Document the rights of individuals (deeds, mortgages, court case files)

Essential records can be on any media or format that contains information that must be protected against loss, including paper, photographic images, microfilm, electronic data systems, electronic images, maps and drawings, or any other media used for recording information of all types. A copy of the prioritized list of essential records should include whether copies exist and their location.

5. Response and Recovery

Each organization has different functions and needs, but at a minimum, the response and recovery section of the plan should include:

- A list prioritizing the order to restore essential organizational functions and the records needed.
- A list of potential disaster types and guidance for responding to each type.
- Up-to-date building plans that indicate where to find emergency exits, fire extinguishers, plumbing, electrical and phone switch panels, circuit breakers and alarms. It is important to know what, if any, hazardous materials are stored on site.
- Intergovernmental agreements or leases of alternate sites where operations can be resumed at some level before decisions are made about the long-term location of the city.
- Documentation of the organization's current telecommunications equipment, computers, hardware and software, and an indication of what is stored on the equipment (i.e. essential records), who used the equipment and if the equipment should be replaced in the event of a disaster.
- Contracts, agreements, or blanket purchase orders with companies that can provide services during a salvage and restoration operation. Professional

services such as document restoration and freeze-drying should also be included along with police, fire, and other emergency response organizations.

- A list of all employees critical to disaster recovery with numbers for daytime and nighttime phones, pagers, and mobile phones. Laminate a wallet-sized card for each one to carry with them always. Lay out a phone tree to make contact easier. Think about drafting a transportation back-up plan in case staff is unable to drive their own vehicle or if public transportation is not operating.
- Depending on its unique circumstances a city may also consider assigning other general and specialized planning elements listed earlier in this chapter.

6. Equipment and Supplies

Pre-positioning equipment and supplies and pre-qualifying vendors is important. It is also advisable to:

- Assemble disaster kits that contain all necessary equipment and list the location of supplies on and off site.
- Store supplies offsite.
- Include an inventory of equipment in the plan.
- Include a map or diagram identifying utility connections, water shutoffs, electric switches, circuit breakers, and alarms.

7. Salvage Priority List

Attach to the plan:

- A list of prioritized essential functions to restore
- A prioritized essential records inventory which includes records series name, storage media and location to allow recovery teams to determine which records must be saved and which can be discarded
- Blueprints and building plans with access routes and locations of records

8. Resources for Specific Recovery Procedures

The State Library and Archives of Florida[21] has published an excellent chart for determining what procedures should be used for each specific type of damage.

The American Institute for Conservation of Historic and Artistic Works has an Emergency Response and Salvage mobile phone application[22] available that included electronic records. One side outlines critical stages of disaster response, such as stabilizing the environment and assessing damage and has practical tips for nine types of collections including books, documents, photographs, electronic records, and paintings.

9. Alternate Location Information for Electronic Records

Depending on the value of the records, the risk and cost, cities may consider:

- Hot sites: a fully configured computer center with equipment installed, data backups and ready to operate.
- Warm sites: a site containing hardware and software but no backed up copies of data and information.
- Cold sites: available space that can be made operational in a disaster.

[21] http://dos.myflorida.com/library-archives/records-management/disaster-recovery/
[22] http://www.conservation-us.org/emergencies/ers-app

- Records or command centers.
- Instructions from all hosted application providers on who and how to contact for access to electronic records; be prepared to supply list of users and their access and contact information. Update any previously supplied emergency lists as required.

10. Information Technology Staff and Equipment

Attach to the plan:

- A list of the city's information technology staff with home phone numbers.
- An inventory of city's information technology and telecom equipment that includes manufacturer, vendor, equipment model, date purchased, serial number, modifications, and applications to help restore operations if replacement equipment is needed.
- A copy of the information technology (IT) administrator's security protocols.

11. Emergency Services Lists

Copies of contracts and agreements with other resources should be kept with the plan.

12. Additional Local Resources

Because it is very difficult to predict all the contingent needs it is a good idea to have some flexibility:

- Keep cash and credit cards available for spot purchases.
- List contact information for the local fire, police, civil defense, ambulance services, disaster response agencies, vendors and professional consultants.
- List specific types of records recovery support including freezer space and/or freeze-drying services and document restoration. Be sure to include contact information for each of these services.

13. Plan Distribution and Updates

Once the plan is complete:

- Distribute two copies to key employees - one for home and one for work.
- Provide copies to all new employees at orientation.
- Distribute copies to the Emergency Management and Business Continuity Teams for inclusion in their plans.
- Collect copies of those plans and include summaries in the records plan.
- Establish a specific time each year for updating and redistributing the plan.

An effective disaster plan is comprehensive, simple, specific, and flexible and it is important to remember that the recovery team must be able to function if power, water, and telephones are not available.

10 AFTER PLAN ADOPTION

Training Staff and Testing the Plan

Upon the plan's implementation, the city will have taken a giant step forward in its preparedness. Annual training of employees will refresh their knowledge of the Disaster Recovery Plan and emergency procedures in general. However, the world's best plan will do little good if it is not periodically tested and updated.

Cities should annually test their emergency plans and procedures for effectiveness. Joining with an emergency management test will allow staff to determine if the records selected as essential will allow city staff to function effectively during the response phase of a disaster. In addition, any gaps or flaws in the plan identified during a test should be corrected in the next revision of the plan and forwarded to others in city government responsible for emergency management planning. The individual or committee responsible for managing the essential records plan should work with other test participants to assess the results of the test and to make appropriate modifications where needed.

When a city government reorganizes, essential records may shift from one work unit to another. In this case, the new location of the records should be updated in the plan. If the city adds an essential function, any essential records supporting the function should be added to the plan.

Design the scope of the test to address the apparent needs of the city or the parts of the city participating in the drill. For example, the scope may only test the effectiveness of certain parts of the plan or changes to the plan made because of a previous test. In addition, a timetable for the duration of the test (i.e. 1 hour, 24 hours, or 3 days after the disaster) needs to be determined. Finally, notify the participants of the test in advance. Let them know the scope of the test and remind them as the test date approaches.

Measurable Goals and Objectives for the Exercise

Each member of the disaster planning team should provide feedback on what parts of the plan did or did not work during the test. This will allow for the development of updates to the disaster recovery plan. To provide a more objective means of evaluating the outcome of the test, set goals and objectives that specify lengths of time. Make sure those goals are attainable and reasonable.

The objective is to identify and make improvements that result in a more smoothly operating plan, not to execute the plan faster than the last time it was tested. A good example of an objective is restoration of critical systems offsite within 48 hours. This object provides both a reasonable timeframe and a measurable goal. Improving communication between executive and administrative staff is not a good objective because it is not measurable.

A way to test the plan is to provide participants with a hypothetical disaster situation and timeline for the exercise. Make sure that participants know what activities to focus on. Establish a method of tracking communication between recovery team members, so that

resulting solutions can be incorporated into the plan. For example, establish a central e-mail account to receive a copy of all e-mail messages sent as part of the test.

Test the plan at regular intervals, once a year is suggested, and incorporate the lessons learned from the exercise into the plan. Periodically testing the plan will reacquaint staff with details of the plan.

Emergency supplies used during a test or in the normal course of business should be replenished. Batteries and disposable cameras (if applicable) should have their expiration dates checked.

Maintain Plan Visibility

The plan should be tested until all parties are confident that it will be effective in a disaster. After the plan has been written, staff have been trained, tests have occurred and been accepted, then establish a schedule for future testing (consistency is the key). In addition, make sure to remind staff to notify the essential records coordinator when changes occur to city programs or to the city's organization. Be sure to update the plan with any changes.

Actions

1. Write a Disaster Recovery Plan for essential and other city records.
2. Identify and list recovery techniques for each record set or type.
3. Assign and train staff for specific duties in the plan.
4. Coordinate this plan with Business Continuity and Emergency Recovery Plans.
5. Conduct a test/drill of the plan.
6. Create a list of resources for the plan.

A APPENDIX – PREPAREDNESS TEMPLATES

Appendix A provides a series of fill-in templates that, when completed, provide the authority, organizational structure and communications system for a records disaster response and recovery plan. It begins with a suggested city records disaster policy statement to be signed by city management. It stresses building a strong disaster recovery team, identifying supplemental assistance, communications, response and recovery forms, and mapping record locations by use of floor plans.

A-1 Records Disaster Policy Statement

Purpose: Establishes a city-wide policy, plan and procedure for the protection of essential records from a disaster, and the recovery of _____ (insert name of city) records damaged in a disaster.

Policy: The policy of _____ (city name) is to ensure that its essential records are identified and protected from natural and human caused disasters; and that procedures are in place, and tested, that will afford the most efficient and cost-effective damage prevention and recovery of all valuable city public records damaged in a disaster.

Scope: This policy applies to all employees who create, receive and maintain _____ (city name) records.

Responsibility: The _____ (insert name and title of city head) has appointed _____ (employee's name) as recovery coordinator, with full authority to develop and implement plans and procedures for protecting city essential records damaged in a disaster in conjunction with the city Emergency Management Plan.

The Coordinator will work with and through the Records Disaster Recovery Team, composed of _____ (List members, as needed, based on the team organization chart shown in Figure 1 on page 34). The team will assist in the development of all parts of the Disaster Recovery Plan. And, under the direction of the coordinator, will lead and participate in all response and recovery efforts.

All damaged records, regardless of office of origin, are to be recovered under the sole direction of the coordinator, or as the coordinator delegates to recovery team members.

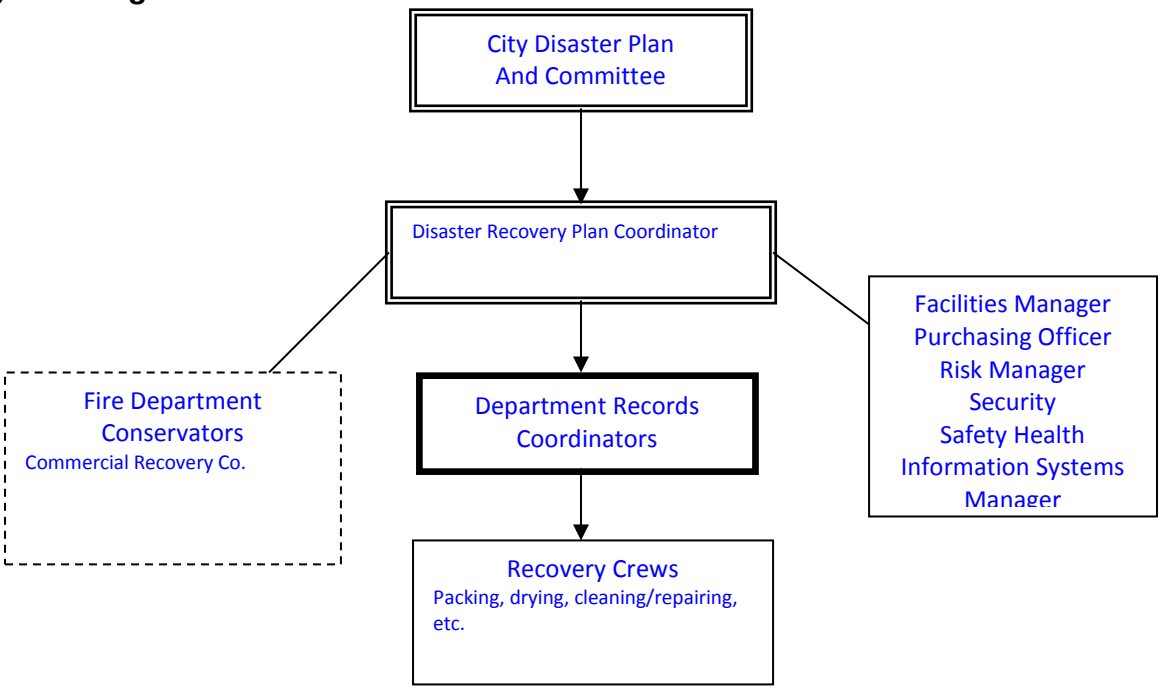
Prepared by: *Insert name(s) of author(s)*

Approved and published: *Insert name of governing body or authorizing official and date*.

A-2 Introduction

Prepare a brief (three to four paragraphs) introduction to the plan, describing how the plan is organized (parts of the plan) and tips on its use.

Figure 1 Organization Chart



A-3 Plan Distribution List

Name of Organization: _____

Date of Plan Completion: _____

Next Scheduled Update: _____

(set a date no more than 1 year in the future to update the plan)

Distribution: List all individuals or offices that receive copies of the plan (including those within your organization or city, outside units, fire and police departments, emergency service coordinators and allied agencies) and locations of file copies. This will help ensure they receive copies of updates.

A-4 Organizing for Response

A-4-1 List of Records Disaster Response and Recovery Team Members

This list provides a quick reference of names and phone numbers for each member of the disaster team. Show the names, phone numbers (office, home, cell phone, and pager), of each team member, their department, and recovery task, i.e. photography, inventory team, data entry, boxing, etc. Also, state the names and phone numbers of city support offices or staff, such as personnel, finance, etc. who may be called upon to acquire supplies, additional personnel or contracted services. Use those that apply to the organization.

Function	Name	Work #	Home #	Cell #
Recovery Coordinator				
Records Recovery Coordinators				
Inventory/tracking data entry				
Photography				
Pack out – boxing				
Pack out – disposal				
Personnel Manager				
Security Head				
Data Processing Manager				
Financial Manager				
Facilities Manager				
Health and Safety Officer				

Add or delete as many as necessary to represent the departments and support functions of your city.

A-4-2 Team Member Responsibilities

Use this template for descriptions of disaster team members' jobs. Insert each position and its job description in this section. Refer to the list of suggested team members in Appendices B and C of this manual and above. Include the authority and responsibilities of the Recovery Coordinator, each departmental coordinator and city support staff. It is useful to have duties spelled out ahead of time so that members can be trained and prepared to immediately and effectively fulfill their respective roles.

A-4-3 Supplemental Personnel

If a disaster occurs that exceeds staff resources, supplemental personnel may be needed. This section lists possible sources of assistance.

The_____
[specify position(s) such as Recovery Coordinator, Personnel Manager, or other] will determine whether volunteers or temporary staff are needed, how many can be used, and qualifications or skills required for the tasks.

A-4-3-a Volunteers

1. The _____ *[specify responsible position]* will initiate contacts with civic groups, service organizations, etc.
2. The following have been identified as possible sources that might provide volunteers to assist with recovery operations: [In establishing contacts, consider organizations such as Boy/Girl Scouts, Elks, Kiwanis Club, Knights of Columbus, Rotary Club, Veterans of Foreign Wars (VFW), American Legion, and labor organizations]

   Organization: _____

   Contact Person: _____

   Phone: _____

   Back-up Contact: _____

   Phone: _____

   Notes: _____

3. If volunteers arrive on the scene without being solicited and the Records Recovery Team is not prepared to use their services:
   - Take their names and phone numbers.
   - Decline their assistance, at least for now.
   - Advise them that they will be contacted if assistance is needed.
4. If volunteers arrive on the scene following a solicitation, _____ *[specify responsible position such as volunteer coordinator]* will register them:
   - Take the person's name and phone number.
   - Interview them to determine their suitability for recovery tasks: experience and knowledge, physical abilities and limitations.
   - Have each person complete a medical/emergency information form.
   - Depending on the advice of the city's insurance carrier or legal adviser, volunteers may sign a waiver of liability.
5. _____ *[specify position such as Personnel Manager or Volunteer Coordinator]* will establish and maintain a system for keeping track of time worked by each volunteer.
6. _____ *[specify position such as Personnel Manager or Volunteer Coordinator, or Training Instructor]* will provide necessary training to volunteers before they begin work.
7. Supervision and work conditions. Volunteers should receive direct and continuous supervision.
   - Volunteers will be assigned to a staff member, who will be responsible for his or her team of volunteers, oversee their work in the recovery operation, and ensure their safety and welfare.
   - No staff member should be assigned more than six volunteers.
   - Volunteers, like other workers, should be given regular breaks and rest periods (and meals, if appropriate).

A-4-3-b Temporary Help Services

1. The _____ *[name position such as the Personnel Manager]* will initiate contacts with temporary help agencies if auxiliary workers are needed.
2. The following sources may be contacted regarding temporary workers: (In establishing contacts, consider organizations like Kelly Professional Services, Manpower, etc. If the city has existing agreements, list them here and (if applicable) indicate purchase order numbers or other authorizations in the "Notes" section of each entry. Some large organizations may also have employment pools that can provide assistance with manual or low-skilled work. Copy this template for the organizations identified.)

   Organization: _____

   Contact Person: _____

   Phone: _____

   Back-up Contact: _____

   Phone: _____

   Notes: _____

A-4-3-c List of City Staff

Insert here a list of city staff by:

- Name and Position
- Phone Numbers, Work and Home (if confidential, do not use without approval)
- Email and Mailing Addresses

A-5 Floor Plans

Insert floor plans that may be useful in a disaster situation, including:

Building and floor layouts, with rooms (with their correct room numbers), aisles, exits and entrances, windows, and evacuation routes.

Identify:

- **Records storage locations**. Indicate location of file cabinets or shelf units by number that is associated with a content list, inventory, or retention schedule.
- **Salvage priorities**. Identify records, by cabinet or storage unit number, that are essential and have not been otherwise protected or duplicated. Refer to the Essential Records Schedule or Recovery Priority List (see Appendix B-8).
- **Fire Safety.** Locations of extinguishers, fire alarms, sprinklers, detectors, etc.
- **Engineering and Mechanical Controls** such as shut-offs and master switches for gas, electricity, water, HVAC system, and elevators.

A-6 Forms

In this section place copies of the forms may be needed in a disaster, such as records recovery tracking system forms, damage assessment forms, recovery checklists, inventory forms, packing lists, requisitions, purchase orders, etc. See examples on next pages.

EXAMPLE

Initial Damage Assessment Report

The purpose of an initial damage assessment is to determine the type and extent of the disaster so that the proper level of response can be mobilized.

Damage Site Location	Date and Time of Occurrence	Total Volume of Records
City hall, 1st floor, room 105	April 27, 2003	3-4dr cabinets or 16 cu. ft.

Type and Extent of Damage		Volume of Records
Water damage minimum (one or more edges wet or damp)	x	3 drawers = 6 cu. ft. Cabinet 4
Water damage moderate (edges wet, water wicked into document text)	x	6 drawers = 12 cu. ft Cabinets 2,3
Water damage severe (papers soaked throughout, in standing water	x	3 drawers = 6 cu. ft. lower drs cabinets 2,3,4
Mold	x	3 lower drawers Cabinet 2,3,4,
Fire damage minimum (smoke, soot, lightly charred edges)	☐	
Fire damage moderate (edges heavily charred, paper discolored, brittle)	☐	
Fire damage severe (papers charred beyond edges, very sooty, extremely brittle)	☐	
Fire damage burnt Burned into center of papers)	☐	
Contamination	☐	

Declaration: No response required ☐ Emergency ☐ Disaster X

Field Notes:

EXAMPLE

DETAILED DISASTER RECOVERY WORKSHEET

RECORD SERIES TITLE VOLUME	LOCATION OF DAMAGE SITE Cabinet, drawer or shelf & box numbers	TYPE OF RECORD ☐ Loose Papers in Folders ☐ Photo Prints ☐ Books or Binders ☐ Microfilm /Film ☐ Electronic	PACK-OUT location:
PREVIOUSLY SECURED AS AN ESSENTIAL RECORD? YES ☐ No ☐ (See Essential Records Schedule)		RECOVERY PRIORITY **(Check priority, with 5 being the highest)** **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐	

TYPE, EXTENT OF DAMAGE, AND RECOVERY TREATMENTS

Fire Damaged Paper Records

☐ **Minimum damage** (smoke, soot, lightly charred edges)

Recovery Treatments
- ☐ Clean gently with soft brush
- ☐ Humidify
- ☐ Re-file in clean folders
- ☐ Other

_____

☐ **Severe damage** (papers charred beyond edges, very sooty, extremely brittle)

Recovery Treatments
- ☐ Separate pages
- ☐ Remove surface soot and dirt
- ☐ Copy or microfilm
- ☐ Discard originals

☐ **Burnt**

Recovery Treatments
- ☐ Infrared photography
- ☐ Discard

Water Damage – Paper Records
Recovery Treatments
- ☐ Remove excess water
- ☐ Place records in containers

Small collection
- ☐ Recovery Treatments

Other

_____

Large collections pack-out to:

Recovery Treatments
- ☐ Freeze to stabilize or dry
- ☐ Freeze dry
- ☐ Desiccant de-humidification dry
- ☐ Thermo-vacuum dry

☐ FILMS: Place in containers of clean cool water, send to re-processor

☐ Electronic:

Some treatment actions may not be necessary and/or other actions may be necessary. See APPENDIX C.

EXAMPLE

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Box	Record Series Title/date	Original	Value	Type of	Extent of	Keep	Freeze to	Recovery	Fumigate	Repair	Date Sent	Date	Returned	Date
2	No		Location		Damage	Damage	Discard	Stabilize	Method		Clean		Returned	to Office	Destroyed
3															
4	1 --4	Payrolls 1988-93	bldg 1	5	WF	3	K	N	FD	Y	Y	13-Apr-03	18-Apr-03	18-Apr-03	
5	5	Gen. Ledger 1990-98	bldg 1	5	W	2	K	N	IA	N	N	14-Apr-03	19-Apr-03	19-Apr-03	
6	6--8	vouchers over 6 yrs old	bldg 1	5	F	5	D	N	N/A	N	N	15-Apr-03	N/A		16-Apr-03
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19	Legend														
20		Essential Record Value	High=5	Low=1											
21		Type of Damage	W=water	F-fire	M=mold	FW=fire &	water	C= conta	mination						
22		Extent of Damage	High=5	Low=1											
23		Keep or discard	K=keep	d=discard											
24		Freeze to Stabilize	Y=yes	N=no											
25		Recovery Method	A=Interleaf	/air	D=desiccant	FD= freeze dry		VF=vacuum freeze	TV=thermo vacuum						
26		Fumigate	Y=yes	N=no											
27		Repair	Y=yes	N=no											
28															

A-7 Operation Center

Identify the spaces which could be used for recovery operations. Include offices and operational spaces equipped with desks, phones, and other basic equipment, as well as spaces which could be used for rinsing, air-drying, and other salvage activities. Pre-identify some areas within the building, but also identify some off-site spaces such as:

- Public buildings: armories, schools, etc.
- Private meeting facilities: Elks, Girl or Boy Scouts, or other service organizations.
- Church buildings
- Commercial property that is for rent or lease
- Rented tents, trailer homes (such as used on construction sites), etc.

Outline the procedures which could be used to transfer office equipment and supplies, as well as telephone, electricity, and other services in the spaces, if they do not have them already.

A-8 Communications Plan

Outline your plans for communicating with staff members, particularly members of the Records Recovery Team. Outline a strategy for notifying them of routine emergencies, but also list the systems and alternatives that can be used when telephone service is disrupted due to earthquake, flood, or other disasters.

In most cases, telephone systems and other communication services will be operating routinely when recovery procedures are initiated.

Once the _____ *[specify Recovery Coordinator or other staff authorized to initiate the Disaster Plan]* declares a disaster and initiates the plan, notification of team members will proceed according to the following plan:

The _____ *[specify Recovery Coordinator or other staff member]* will notify the following:

List the city officers in the notification order. It would be typical for first-phase notification to include the Chief Administrator, Chief Safety Officer, Records Manager, Data Processing Manager, and Financial Liaison.

Name/Title Office Phone Home/Cell Phone

_____

_____

Contact information for each is available in the City Staff List in Appendix A-4-3-c.

List the disaster recovery team members that need to mobilize to respond to the records disaster.

Name/Title Office Phone Home/Cell Phone

_____

_____

(See Appendix A-9 for a list of other organizations that should be notified).

A-9 Emergency Contact Numbers

Name, Phone: Workday and After-Hours

Ambulance _____

Building Maintenance _____

City Emergency Management Officer _____

Emergency Management Division of the Oregon Military Department _____

FEMA _____

Fire Department _____

Hospital _____

Insurance Agent _____

State Archives: 503-373-0701

Police/Sheriff _____

Risk Manager _____

Security Office _____

Security System Co. _____

State Patrol _____

Telephone Co. _____

Utilities: Electric _____

Utilities: Gas _____

Utilities: Water/Sewer _____

Utilities: Other _____

Other: _____

B APPENDIX – RISK ASSESSMENT TEMPLATES

Appendix B provides procedures, forms and suggested lists of records for developing an essential records protection program. It recommends methods of backing-up and restoring electronic records when there is no established information technology department or existing electronic records protection plan. Prevention procedures and risk assessment checklists are also contained in this appendix.

Use this section to document your plans for protecting essential records, and the identification, reduction and mitigation of disaster hazards. Use the physical city or city risk assessment inspection checklists to conduct an assessment to identify the city's vulnerabilities and needs before preparing these plans.

B-1 Essential Records Protection Policy and Procedure Model

PURPOSE: Essential records protection is a major part of an overall preparedness and recovery program for disasters that affect City records.

> The Essential Records Protection Plan is a procedure for protecting the _____ (city's name) essential records from disaster. It consists of a schedule which identifies records essential to the operations of the city during an emergency, and those records essentials to the recovery of normal operations after a disaster. The schedule specifies how those records are to be protected, and establishes how often they are to be updated or cycled.

POLICY: It is the policy of the (city's name) _____ to ensure the protection of records deemed essential to the functions of the city during an emergency, and to restoration of normal operations afterward. Examples of those records are:

- Records needed to protect the rights and interests of the public
- Records needed to protect the rights and interests of the city
- Records necessary to fulfill the city's obligations to employees
- Records needed to protect the legal and financial integrity of a program
- Records required to maintain the technical ability and efficiency of the city
- Records, the loss of which would make resumption of operations prohibitively expensive or impossible

SCOPE: This policy affects all employees who have records keeping responsibilities.

RESPONSIBILITY:
The city Recovery Coordinator or Records Manager will:

- Assist in the identification of their essential records;
- Assist in determining cost effective methods of replication and protection;
- See that the essential records schedule is updated annually;
- Maintain the official copy of the essential records plan;
- See that records are replicated appropriately, sent to storage on time, and destroyed as scheduled; and
- See that essential records sent for storage are documented, boxed and labeled.

PROCEDURE:

Updating the Essential Records Schedule (see example on page 44)

Each year, the Recovery Coordinator or Records Manager will send a memo to all program directors requesting that their program's essential records schedule is updated.

Departmental Recovery Coordinator reviews the schedule with the Department Director. This review should consist of an administrative evaluation of whether each record series listed on the schedule continues to merit inclusion and the attendant costs of replication and storage, if any. (This evaluation should consider the city's policy stating what types of information requires protection.) The review should include consideration of any new records series developed as part of new or added program functions; and should consider new and less costly methods of replication resulting from the application of technology.

Changes, additions and deletions to the essential records schedule can be made by annotation directly onto the current program schedule form. Make sure the following information is accurate for each series:

- Record titles: identify the records series by title and Record Series Number from the City Records Retention Schedule.
- Media: indicate how the records series will be replicated for security storage; i.e. paper or electronic media. Consult with the Records Manager for advice and assistance on replication. A series may already be replicated and secured electronically or may be easily secured if the information is on an electronic system.

There are several methods of providing security copies of essential records. Usually no single method will suffice for all records. Consider the following questions in deciding. Each record series should be examined in terms of:

- Frequency of use
- Useful life of the media
- Availability of existing copies
- Volume of the records involved
- Cost of copying and storage

Use of existing copies protected through natural dispersal. Some records exist in multiple copies. One of these copies can be designated as the essential record protection copy for such records. Examples of multiple copies are:

- **Paper Duplicates** - Where copies do not already exist, the production of additional hardcopies of a record identified as essential may be merited. This is practical when the *volume is minimal* or the *update cycle is frequent*
- **Microfilm or computer output microfiche** - These methods are most commonly used for providing security copies of records which are voluminous, not superseded or updated frequently and have long term or permanent value.
- **Electronic Media** - This method is best used when the essential record is already in electronic form; where volume makes paper copy impractical, and when the information is frequently updated or superseded.

Update Cycle - Indicate the frequency that the record series is to be supplemented or superseded. It is important to establish an update cycle as frequently as practical to keep

the information or data current. Consult with the city IT department or Records Manager regarding update cycles for electronic records.

Security Storage Site - Indicate the security storage site to which each essential record series is to be sent. The following abbreviations may be used:

- ER for electronic records sent through department to a designated security site.
- RC (Records Center) for paper and microfilm copies of essential records to be sent to the Oregon State Archives.
- ND for natural dispersal. Indicate the office which has the security duplicate.

Methods of Security Storage are:

- Natural dispersal
- Remote or off-site storage
- On-site storage

Sign-off - The updated schedule must be signed by the Program Manager.

Transferring Essential Records to Security Storage Sites

Electronic Records
Essential records in electronic form on systems managed by the city will be transferred to secure storage according to the cycle established on the schedule.

Microforms
Essential records in microfilm or microfiche form are to be boxed in acid free microfilm containers (special order). Label the containers as follows:

> ***RECORD SERIES TITLE***
> Inclusive dates of records in the container
> Department or office of record
> Retention time in security storage

Send the boxed film to the city Recovery Coordinator or Records Manager.

Paper Records
Essential records to be secured in paper form are to be boxed and labeled using the city or commercial records center storage boxes and labels per instructions for transferring records to off-site storage.

Except for essential records in electronic form, all records transferred for security storage must be accompanied by a completed Records Center Transmittal form. A sample form is included at the end of the Appendix. Annotate the form to identify the materials being sent as being for “Essential Records Security Storage.” (A sample Records Destruction Request form and Box Label are also attached.)

Cycling Essential Records
Some essential records will continue in security storage with periodic additions. Others will be cycled out and replaced with updated material per the Essential Records Schedule. Records scheduled for cycling out will be returned to the office of origin, or destroyed as indicated on the schedule when superseding records are received by the records center. Electronic records will be erased by city when scheduled for replacement.

B-2 Records Retention Schedule

EXAMPLE

ESSENTIAL/VITAL RECORDS SCHEDULE

1. OAR Series Number	2. Record Series Title	3. Media	4. Update Cycle	5. Retention	6. Protection Instructions
166-200-0235 (5) (a)	Council Minutes	Microfilm	Annually	Permanent	Send security copy of microfilm to State Archives
166-200-0380 (12) and (16)	Ordinances and Resolutions	Microfilm	Annually	Permanent	Send security copy of microfilm to State Archives
166-200-0380 (1)	Annexation Files	Microfilm	Annually	Permanent	Send security copy of microfilm to State Archives
166-200-0265 (4)	Franchises	Microfilm	Annually		Send security copy of microfilm to State Archives
PROGRAM		**DIRECTOR APPROVAL**		**DATE**	**Disaster Recovery Coordinator or Records Manager.**

B-3 Essential records in the City Records Retention Schedule the city may hold.

CITY RECORDS RETENTION SCHEDULE

Essential records are those that may be considered vital to the city's operations in the event of a disaster. To view the current Oregon Administrative Rules (OAR) Archives Division – Chapter 166, the City General Records Retention Schedule, visit the web address below.

https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=590

Note: vital records are identified with an * in the State Retention Schedule.

B-4 Electronic Records Backup and Recovery

Put data processing plans here. If the city has an Information Technology (IT) Department, it probably has a disaster protection and recovery plan. If there is no IT or plan, one should be developed, even if it is for "stand alone" desk-top computers. In this section, list:

- When and how routine backups are to be done and where off-site copies are to be stored
- How to get access to off-site storage copies, including nights, weekends, and holidays
- Potential hot- and cold-sites that could be used if data processing functions must be transferred off-site
- How equipment, software, and data files would be moved to those off-site locations
- Companies that can salvage computer equipment, data, etc. (see Appendix D)

The primary strategy for protecting data on small systems is like those developed for protecting large ones. The main defense is duplication. Data on servers and PCs should be backed up routinely: normally daily and weekly. The backup data should be stored in a safe place, off site. Programs, operating systems, and documentation should also be stored off site. Disaster team members must have access to everything.

BACKUP CONCEPTS FOR ELECTRONIC DEVICES

Approach the problem of backing up computers with the assumption that important data is always at risk. It is not a question of 'if' the data will be compromised but 'when'.

NOTE: It is far easier to back up and restore data than to attempt to salvage the media.

The most common scenario for data loss in personal computers is hard drive failure. Whether it is critical operating system files that become corrupt or a physical failure of a drive itself, data can often be recovered. But it will take time, effort, and money.

For laptop owners, a likely and threatening scenario is theft. In this situation, critical data is gone forever, with little hope of any recovery.

Other causes for data loss include:

- Failure due to environmental hazards like power surges, spikes, electrostatic shocks and heat
- Negligent or unauthorized users
- Malicious code, viruses, hacker intrusions

Backing up data is not a difficult task. For most people, identifying which data to back up can be the most challenging part. Figuring out where to place the backup data can also

be challenging. However, once a process is identified, backing up data can be a simple routine that is easy to schedule or automate.

Data

- Define the information to be backed up
    - Critical data that cannot be reproduced
    - Applications, setup files and source code that only reside on the hard drive.
    - Documents, database, web content, images and any other files that are considered important

- Consolidate/organize data in a way that is manageable
    - Data should be organized in a way that makes sense to the user
    - Consolidate backup data under a source directory
        - 'My Documents' is an example for Windows users
        - Data can be consolidated under a user profile if multiple users access the system
        - If applicable, identify other ways that data can be organized within subfolders.
            - Dates – Useful for financial records
            - Type of content – Images
            - Subject – Documents, projects, etc.…

Organizing and consolidating data within a source directory allows the user to quickly and easily identify a group or groups of data that should be backed up. Further organization helps the user assign priorities and schedules and creates logical associations for recovery purposes.

BACKUP MEDIA

If the PC or laptop is connected to a Local Area Network (LAN), the first choice of backup media is the LAN itself. This is assuming that the LAN is routinely backed up.

If not backed up to the LAN, the choice of backup media depends largely on the preference of the user. However, a few guidelines should be followed:

- Media should exist in different location than source
- Media should be easily portable
- Media should be current with modern technology

B-5 Risk Assessment and Prevention Procedure (Templates)

Awareness is important in disaster prevention efforts. Vigilance can often prevent a disaster or minimize the damage of a disaster. Employees can take the initiative to be troubleshooters and note problems that may be occurring in the building.

Problems such as leaky pipes, cracked windows, toilet problems, or unusual odors (particularly those that could indicate a fire) should be brought to the attention of the _____ *[specify Maintenance Supervisor, Recovery Coordinator, etc.]*. Correcting a problem before it develops into a full-blown disaster can save great amounts of labor and thousands of dollars of records recovery and equipment salvage costs.

1. The _____ *[specify personnel officer or other]* will insure that each new staff member reads a copy of the Records Disaster Response and Recovery Plan. Supervisors will also read the plan and become familiar with its layout and content.
2. The _____ *[specify Recovery Coordinator or other staff]* will inventory the disaster supply kit(s) _____ *[specify frequency; monthly, quarterly, annually]*, noting the supplies on hand, those needing to be refreshed, and those that would have to be purchased in case of emergency.
3. The list of vendors and consultants in *Appendix D -- Supplies and Services,* will be updated _____ *[specify annual or more frequent updates]* by_____ *[specify Recovery Coordinator or other staff]*.
4. The _____ *[specify Recovery Coordinator or other staff]* will review the full Disaster Response and Recovery Plan _____ *[specify annual or more frequent review]*, updating sections as necessary, and distribute copies of updates to the Disaster Recovery Team members, and designated city staff.
5. The _____ *[specify Recovery Coordinator or other staff]* will arrange for inspections using the Inspection Checklist and work with appropriate staff to ensure that problems are remedied.

B-6-1 Facility Risk Assessment Inspections

B-6-1-1 Maintenance

The _____ *[specify maintenance/facilities department or other appropriate unit]* will identify and inspect all areas and equipment that may cause or be subject to damage in a disaster. These will include areas noted in the Inspection Checklist (see examples at end of section) that relate to:

- HVAC system
- Electrical appliances and wiring
- Plumbing and drainage
- Housekeeping

If possible, also state the frequency of these inspections and that copies of completed inspection reports will be submitted to the Recovery Coordinator.

B -6-1-2 Fire Safety

The _____ *[specify Safety Officer or appropriate unit]* will manage the fire safety program. This will include inspection and maintenance of fire protection systems and devices. Activities and inspections will include areas listed in the Inspection Checklist that relate to:

- Fire extinguishers
- Fire alarm system
- Smoke and heat detectors
- Fire suppression systems (sprinklers, halon, etc.)
- Liaison with the Fire Department
- Staff training

If possible, also state the frequency of these inspections and insure that copies of completed inspection reports will be submitted to the Recovery Coordinator.

B-6-1-3 Security

The _____ *[specify safety office or other appropriate unit]* will manage the security program, in conjunction with _____ *[specify Recovery Coordinator, or Records Manager or other unit that supervises use of the records and record systems]* who oversees use of the records within the facility. This will include inspection and maintenance of security systems and devices such as sound alarms and silent alarm subscription alarm services. Activities and inspections will include areas listed within the Inspection Checklist that relate to:

- Key control
- Monitoring of security devices on doors and windows, inside and outside of the building

If possible, also state the frequency of these inspections and that copies of completed inspection reports will be submitted to the Recovery Coordinator.

B-6-1-4 Record Storage Areas

The _____ *[specify appropriate Recovery Coordinator, Records Manager or officer, manager, supervisor]* will ensure periodic inspection of records storage areas according to criteria listed in the Inspection Checklist. Inspections will give attention to:

- Signs of leaks, water damage, etc.
- Signs of mold, insect, or rodent infestation
- *[Add other reminders for threats to your records and facilities]*

Inspections will include all additional on- and off-site areas used for records storage.

If possible, also state the frequency of these inspections. Daily inspection is recommended. Also note that copies of completed inspection reports will be submitted to the Recovery Coordinator, if that is a different person than the Records Manager, who has responsibility for inspection of the records storage areas.

B-7 Records Risk Assessment Inspection Checklist Templates

The following checklist templates can be useful in carrying out risk assessment inspections. Their use can reduce vulnerability of records in a disaster. Some of the inspections outlined in those checklists may be the duty of personnel responsible for facilities maintenance, safety and fire prevention and not the Records Manager. Work with those individuals to develop a reasonable schedule for the inspections and establish mechanisms to verify that inspections are done as scheduled. Create a procedure that ensures notification of remedial actions needed and taken. Retain copies of completed inspection reports here or see that the Risk Management Officer receives and retains them.

Records Risk Assessment Inspection Checklist Templates

1. General Preparedness	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
Disaster Preparedness and Recovery Plan written and updated			
Emergency Instructions posted at all staff phones			
Disaster supply kit(s) created and inventoried on schedule			
All shut-off valves, breaker switches, etc. properly labeled			

2. Plumbing	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
Pipes and plumbing well-supported			
Pipes and plumbing free of leaks			
Staff know location of water main and have appropriate tools (if needed) for shut-off			

3. Fire Safety	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
Appliance cords in good condition			
Appliances turned off and unplugged nightly			
Schedule visits with the Fire Marshal to follow-up on observed code violations			
Floor plans identifying location of essential records given to Fire Department			
Detection systems:			
appropriate type(s) present			
wired to 24-hour monitoring station			
tested regularly			
Fire extinguishers present, inspected regularly and re-charged if necessary			
Automatic suppression system (e.g., sprinklers, halon) present			
Fire drill conducted twice per year			
Staff trained in:			
sounding alarms			
interpreting enunciator panels (if present)			
notifying Fire Department and others as needed			
using extinguishers			
turning off power, HVAC, sprinklers, gas main			
closing fire doors			

4. Housekeeping	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
Cleaning supplies and other flammables stored safely			
Trash removed			

5. Files and Records Storage Areas	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
Shelves well-braced			
Items shelved snugly			
Shelving 4-6" off floor			
No materials stored on floor			
No essential records or valuable materials in basement			
Exits unobstructed			
Important materials away from windows			
Flashlights kept in windowless and dark areas, and batteries checked			

6. Protection from Water Damage	**OK?**	**Needs Action** (Describe)	**Action Complete** (Date & Initial)
No water sources located above records			
Water detectors present			
Storage areas checked daily for leaks, seepage, etc.			
Sump pumps and backups present where needed			
Dehumidifiers available			
No leakage/seepage through walls			
Valuable materials stored above ground level			
Valuable and fragile media stored in protective enclosures			
Staff have keys to mechanical rooms and janitorial closets			

B-8 Records Recovery Priorities

In the event of a disaster, unprotected essential records should be transferred to a safe location, or salvaged in the priority order assigned below. Also see Appendix A-5 -- Floor Plans for locations of these materials and for area-specific disasters.

Priority Materials (Specify record series, file number range, item, etc.)	**Location** (Specify building, floor, room, cabinet)	**Departmental Coordinator**
1)		
2)		
3)		
4)		
5)		

SAMPLE

RECORDS TRANSMITTAL
CITY RECORDERS OFFICE **ARCHIVE BOX NO. _____**

TO: Records Management Date: _____

FROM: _____ Department: _____
(Sender's Name)

RECORD SERIES NUMBER	RECORD DESCRIPTION	DATE(S) OF RECORDS

I certify the records transmitted herein for retention by Records Management are complete and accurate as transmitted.

Record Coordinator Signature: _____

Date: _____

Accepted by Records Management:

Retention: _____ years Disposition: Recycle _____ Shred _____

SAMPLE

RECORDS DESTRUCTION REQUEST

SECTION 1. REQUEST: (Department Records Supervisor)

Series Title: _____

Record Series No.: _____ Inclusive Dates: _____

Minimum Retention Period: _____

Description of Record Series: _____

Records Media: Microform Job No._____ Film Date _____ Verified _____
Paper Files: Cubic Feet _____ Current Storage Location: _____

Department Records Supervisor: _____ Phone Ext: _____
Signature
Department: _____ Division: _____ Date: _____

SECTION 2. ELIGIBLE FOR DESTRUCTION. (City Clerk/Recorder's Office)

Records Manager: _____ Date: _____
Signature

SECTION 3. DIRECTOR'S APPROVAL

Director's Signature: _____ Date: _____

SECTION 4. CERTIFICATE OF DESTRUCTION

Destroyed by: _____ Date: _____

Title: _____ Department: _____

Method of Destruction: (circle one) Shred Recycle Other

Original: City Recorder/Records Manager
Copy: Department

SAMPLE

Box Label

ARCHIVES

Box No. ____ of ___

Department: _____

RECORD SERIES NO. _____

CONTENTS:

Retention: _____

Destroy: _____

C APPENDIX – RESPONSE AND RECOVERY PROCEDURES

Appendix C contains procedural templates for responding to minor emergencies and major disasters that affect records. It also provides detailed instructions for recovering paper and other media damaged by water fire and contamination.

C-1 Disaster response and recovery procedures are the steps taken from the time a disaster situation is detected to the time when records are packed out, dried or otherwise salvaged and then restored to use. This section provides fill-in templates and specific procedural instructions that comprise a plan for response and recovery of damaged records. The extent and order of the steps may alter depending on the nature of the emergency, extent and type of damage, and available resources.

The primary natural disaster occurrences in Oregon are earthquakes and flooding. Earthquakes can cause water and sewage pipes to break which can result in records damage. Earthquakes can also knock over wall shelves, storage units, and book shelves which will exacerbate the problem. Flooding occurs almost yearly in river basin and bottom land areas.

Regardless of the damage source, the Recovery Coordinator should be among the first of city staff notified of a disaster affecting city facilities. Notification is a critical step to the successful recovery of damaged records.

C-1-1 Notify Records Disaster Coordinator

During working hours, contact the Recovery Coordinator, _____ (Insert name, title, and office phone number of the person who will determine damage by phone or through an inspection of the site.)

After-hours, notify: _____ (It may be appropriate to list (a) the maintenance/facilities staff, (b) the Recovery Coordinator, and (c) the security office.)

Name/Title	Office Phone	Home/Cell Phone

C-1-2 Assemble the Records Disaster Recovery Team

The Recovery Coordinator mobilizes the Records Disaster Recovery Team using the telephone list in A-4-1.

C-1-3 Gain Access to the Damage Site

After a fire or other major disaster, the Recovery Coordinator must gain access to the damage site quickly. The Fire Marshal city security or safety officer or other public officials will oversee the building and will declare when it is safe for re-entry. The coordinator will have to work within their decisions, which can jeopardize successful recovery. It is best to have reached an understanding about the value of the records and the need for quick access with the responsible authority ahead of time.

C-1-4 Initial damage assessment

The Recovery Coordinator and/or team should determine what level of response is warranted and whether to declare a records disaster.

- The situation will be deemed a minor records emergency if the nature and extent of damage is of limited severity and can be dealt with by available personnel. See Appendix C-2-1 Minor Water Damage and C-2-2 Mold and Mildew Outbreak.
- A records disaster will be declared if the nature and extent of damage warrants resources beyond those available at the time. See Appendix A-6 Forms for an example of an Initial Damage Report Form

C-2 Minor Records Emergency Response

C-2-1 Minor Water Damage

The following procedures are for minor water damage from roof leaks, plumbing system malfunctions, plugged drains and similar emergencies. The Recovery Coordinator or team should determine what level of response is warranted.

1. If easily done, attempt to determine the cause or source of the water.
2. Call, in the following order: *(*It may be appropriate to list a plumber or the head of building maintenance. Some organizations may also want the security office notified.)

   Name/Title Office Phone Home/Cell Phone

   _____

   _____

3. If records and/or record systems are threatened by water, immediately notify the Recovery Coordinator. (Insert name, office phone, and home phone or his or her designated back-up)

   _____

4. If neither is available, call in the following order:

   Name/Title Office Phone Home/Cell Phone

   _____

   _____

5. Attempt to cut off water if feasible. See building and floor plans for the location of water shut-off valves.
6. Turn off all electrical circuits in the affected area. No one should walk through water until the appropriate safety officer has declared the area safe.
7. Pull the in-house disaster supply kit located _____ (specify location).
8. Protect the records while awaiting assistance (Choose a. or b.):
   a. If water is coming from above, get plastic sheeting located in _____ (specify location) and use it to cover affected areas, cabinets, shelves, etc.
   b. If water is coming in on the floor, get hand trucks, carts, or dollies located in _____ (specify location) Remove materials from affected area beginning with those in lower drawers and shelves, and move them to a safe location.

9. Remove any standing water with a wet-vac, located _____ (specify location).
10. Take steps to reduce the temperature and humidity and to increase air circulation:
    a. Measure the temperature and relative humidity using monitoring devices in the supply kit.
    b. Turn on air-conditioning or lower the temperature setting.
    c. Increase air circulation in the affected area by running fans continuously.
11. Initiate response procedures and instructions detailed in the Appendix C-3 scaled to the need. If the quantity of damaged materials is less than 50 volumes or three file drawers, they can be recovered in-house using air-drying techniques. (If the quantity of damaged materials exceeds that amount, a decision must be made between (a) freezing them and then air-drying in small batches or (b) calling in a company that provides drying services. Indicate that decision here.)

C-2-2 Minor Emergency Response: Mold and Mildew

Spores of fungi (mold and mildew) are found almost everywhere. They only require the proper conditions of moisture, temperature, nutrients, and sometimes light to proliferate. Media such as paper, cloth, leather, and adhesives may be consumed or stained by many types of mold. The combination of temperature and humidity remains the most critical factor influencing their growth. General cleanliness and the removal of dust and dirt reduce the risk of infestation.

When the temperature reaches 70 degrees-Fahrenheit and relative humidity is near 70 percent, conditions are ideal for growth and reproduction of most types of mold. Any rise in these levels creates an environment conducive to increased mold and mildew growth. They will generally grow within 48 to 72 hours after the onset of these environmental conditions. It is important to note that the absence of visible growth at low temperatures does not indicate the death of spores.

<u>What is mold?</u>

- Mold is one of a family of environmental microbes that includes yeasts, mildew and mushrooms. Mold is the most prevalent form of contamination.

<u>Requirements for growth:</u>

- Spores - are everywhere
- Moisture - +70 percent relative humidity
- Temperature - if it's comfortable for humans, it's great for mold
- Food source - eats anything organic (paper is a delicacy)
- Time – growth can begin in 48 hours if conditions are right

<u>How to recognize mold:</u>

- Musty smell resulting from digestive process
- Colored spots on paper (early stage)
- Holes eaten in paper (advanced stage)
- White, beige powder forms (usually a sign of dead mold, but does not mean material is free of live mold or dormant mold spores)

How to destroy mold:

- Dehumidification
- Fumigation
- Freeze drying
- Vacuum fumigation or vacuum drying

The onset of mold is of major concern in recovery. It consumes and destroys paper and book bindings. Some people will have an allergic reaction. Some molds can be toxic. Workers should wear masks or respirators and disposable gloves when working with records containing mold.

A mold outbreak can occur if temperature and humidity controls are not adequate, but also may be the result of a flood or other water damage. In the event of an infestation, take the following actions:

1. If mold is on a few isolated items:
   Place items in freezer bag located in _____ *[give location]*.
   Call the Recovery Coordinator, _____ (Insert name, office phone, and home phone). If he or she is not in the office, leave a message.
2. If mold is discovered in whole drawers, stack ranges, or storage areas, call: *list here:* (a) a representative of the maintenance/facilities department who can adjust the temperature and humidity, (b) the Recovery Coordinator, and (c) the Recovery Coordinator or Records Manager.

Name/Title	Office Phone	Home/Cell Phone

   a. Transfer all infected materials to an isolation room (insure that other areas will not be affected as the materials are being transferred). Seal materials in multiple plastic bags.
   b. Immediately and thoroughly clean and sterilize the affected storage area(s) (see item six below), including the climate control system if possible.
3. Determine whether the affected records must be retained. Consult the Recovery Coordinator/Records Manager to verify retention requirements. Consider reformatting (photocopying, microfilming, etc.) badly damaged/affected items.
4. If the records must be salvaged, consult a conservator or preservation specialist (see Appendix D -5 Supplies and Services) when dealing with severely affected materials. Sunlight or ultraviolet light also kills mold. Expose individual documents directly for 10 to 20 minutes. Avoid quick and easy cures. Some “fast cures” such as spraying records with Lysol or cleaning with fungicides can have adverse effects on records and people. Leave chemical “cures” to people with training and proper equipment. See https://ccaha.org for helpful information in records salvage.
5. Dead mold residue can be removed from documents using a vacuum with a soft brush attachment. The vacuum should be fitted with a HEPA filter to stop the spread of mold spores. Always work from the center of the document to the edges.

6. Large scale mold invasions can be destroyed using desiccant air drying, vacuum drying, and freeze drying; however, freeze drying will not kill mold spores.
7. Check treated materials periodically (at least monthly) for evidence of new or recurrent mold or mildew growth.

C-3 Major Record Disaster Response Procedures

C-3-1 Establish Security Measures

1. The _____ (Indicate Facilities Manager or other personnel) will secure the site as far as possible by replacing doors and windows or by other means.
2. Only authorized persons will be allowed to enter the site. They will be designated using _____. (Possibilities are: identification badges, phosphorescent vests, specially marked caps or hard hats. If these are specified, the organization must have an ample supply purchased and pre-printed and maintain them in the in-house disaster supply stockpile so they will be available immediately.) The personnel officer will be responsible for distributing these and will maintain a sign-in and sign-out register.
3. Special security personnel may be required if the security system has been damaged, if doors or windows are damaged, or if the facility is not substantially intact. In such cases, the Recovery Coordinator will work with the Security Officer to arrange for adequate security.
4. Immediately report unauthorized persons in the disaster area to the team captain, immediate supervisor, or security officer.

C-3-2 Establish an Operations Center (See Appendix A-7)

In a routine emergency where the building is intact, operations will be controlled and coordinated through the Recovery Coordinator 's office, located at (Indicate address, room number and phone number). _____. If off-site space is required for operations control or for recovery activities (sorting, packing, drying, etc.), consult the Supply and Service Providers List in Appendix D-4.

C-3-3 Stabilize the Damage Site

The _____ (name a position) will supervise the stabilization of the building. Priority will be given to actions that ensure the safety of people. Second priority will be for the restoration of power. Other actions will receive attention as soon as possible. Actions that may be needed include the following:

- Work through proper authorities such as the Department of Ecology and local health departments and HAZMAT units on cleanup of sewage, biological agents, chemicals, and other contaminants
- Shut off and repair/restore utilities (gas, electricity, etc.)
- Stabilize leaning or collapsed shelving
- Remove mud, water, ceiling tile debris, broken glass, etc.

C-3-4 Stabilize the Environment

The _____ (name a position) will supervise the restoration of environmental controls with the goal of providing a cool, dry climate in the affected area.

1. If the heating/air-conditioning system is operable, settings will be adjusted to provide maximum cooling and dehumidification, with the goal of maintaining the temperature below 70 degrees and the relative humidity below 50 percent, and the system will run 24 hours per day.
2. If the heating/air-conditioning system is not working due to damage or power outage, use oscillating fans to circulate air. Stagnant humid air will exacerbate mold growth.
3. The _____ (name a position) will ensure that staff monitors the temperature and humidity at least every four hours to measure progress. The following monitoring devices _____ (specify which ones are available) are in ___ (specify location)

C-3-5 Stabilize the Records

If site stabilization is not possible, most records will have to be moved off site. Undamaged records should be moved to a warehouse, city or commercial records center or rented space that has a suitable environment. Records damaged by water can be stabilized by freezing.

The Recovery Coordinator _____ (or name a position) activates agreements for the use of cold storage and warehouse space made as part of the Disaster Recovery Plan or requests the city purchasing officer to secure space for both damaged and undamaged records. (See C-5-2 Freezing.)

C-3-6 Make a Detailed Damage Assessment

The Recovery Coordinator, photographer and other team members as assigned will make a detailed assessment of damage. The photographer will use the camera and film stored in the disaster stockpile in _____ (room number or location) or use available equipment.

The assessment can be made using a report form (See example: Appendix A-6). It should be far more detailed than the “Initial Damage Report” but should not be made at the drawer or box level. Doing so would simply cost too much time. At a minimum, it should be made at a room or area level and at a maximum at the cabinet level.

Based on the requirements of the city’s insurance carrier, risk manager, or state/federal emergency management agencies, additional details may be added about the types, form, and level of documentation that is required.

C-3-7 Develop a Detailed Plan of Action

The _____ (specify personnel who will be involved, including the Recovery Coordinator and Facilities Manager) will meet to review the extent of damage, status of building systems, and available personnel. They will develop a plan of action that addresses major issues in the Records Recovery Plan.

If damage is extensive, the plan may require decisions on what records to salvage based on value, extent of damage, and whether they are duplicated elsewhere.

Utilize the Functional Risk Probability Analysis, the Records Recovery Priority List, and the Essential Records Schedule (see Part 1, Chapters 1 and 4) to aid in decision making. Document each decision for insurance and public disclosure purposes.

Determine the kind and degree of damage that records in each location have sustained. These will be "gross" designations, not on an item, box or drawer basis, but (depending on the extent of the disaster) on a range, cabinet, or room basis. Use a scale for rating degree of damage, i.e., Level 1 to 5, with Level 1 indicating minor or no damage and Level 5 indicating extreme damage.

In the event of a large-scale disaster, a key decision will be which recovery operations to handle with existing staff and which to contract to disaster recovery companies. This decision will influence all facets of the recovery plan.

1. Which materials will be salvaged and which discarded?
2. Will the disaster recovery team or staff handle the salvage operation, or will some or all of it be contracted to disaster recovery specialists?
3. How will the materials be salvaged? Recovery operations for records to be air-dried locally differ from those that are appropriate for records to be sent to a drying facility.

See Appendix E for information about drying methods.

Text in this section provides basic information and general guidelines, but may require significant revision based on local situations and decisions.

Before salvage begins, the _____ (Recovery Coordinator) will:

- Determine the salvage priorities for various city records, based upon those given in the “Recovery Priorities” list in the Plan but modified based on the type and extent of damage and the services and funds available.
- Decide what drying and other recovery methods to employ, and what resources must be mobilized.

The disaster team and other staff will be briefed on the plan of action and their responsibilities in it. If appropriate, training in specific techniques such as packing, cleaning, or air-drying will be offered by _____ (specify a position).

C-3-8 Procure and Assemble the Necessary Supplies and Services

The city Procurement Officer will consult with the Recovery Coordinator and Personnel Manager to determine what supplies and services are required for the recovery operations. The in-house supply and equipment stockpile inventory is in Appendix D-3. External suppliers and service providers already identified are listed in Appendix D-4.

C-3-9 Determine and Assemble Additional Personnel Needed

The following also may be called to help:

- Supplementary city personnel
- Volunteers or Temporary Help
- Others as determined by the Recovery Coordinator

City personnel shall be informed exactly when and where to report. Additional details are provided in Appendix A- 4-3- c andA-8 - Communications Plan.

C-4 Pack Out

This section assumes that all the items covered in the "Response Procedures" have been addressed including triage decisions about which records to salvage and in what order and by what method.

If on-site training is required, it will be provided by ____ (specify the Recovery Coordinator or other position). If more extensive training is needed — for example, for volunteers or temporary workers — it will be organized by _____ (specify the Personnel Manager or other) and led primarily by _____ [specify the Training Instructor or other position].

Records usually must be removed from affected areas for immediate drying in a stable location within the organization, to a cleaning or recovery area within the organization, or transported to a freezer facility or a commercial drying facility.

Execute the pack out operation in the order determined by the Recovery Coordinator, based on the "Recovery Priorities" list and the degree of damage. If a full range of recovery services is available, it is generally appropriate to begin with the wettest materials and move to those that are merely damp. However, if the organization is limited to air-drying using staff resources, it may be better to begin with those that are least damaged and therefore most quickly recovered.

C-4-1 Organizing Pack Out

Depending on the nature and extent of damage, available help and possible logistical constraints, work crews in the pack out operation will consist of people assigned to the following tasks:

- **Pack Out leader**: ensures smooth workflow, alleviates bottlenecks, and troubleshoots.
- **Box assembly**: sets up boxes, etc.
- **Retrieval**: removes materials from shelves, cabinets, floor, etc., attempting to pull materials of similar size for each container.
- **Wrapping**: cuts freezer/waxed paper (necessary for bound materials only).
- **Packing**: takes items from retriever and wrapper, and boxes items.
- **Sealing**: seals and (working in concert with recorder) labels containers.
- **Record keeping**: keeps a written packing list.
- **Transporting**: moves containers from packing area to pallet, elevator, stairs, etc.

C-4-2 Packing for Pack Out

Pack out procedures for wet records depend on whether materials are being transported to a nearby area for immediate drying or to an off-site cold storage or freeze-drying facility. The latter requires more careful packing and more thorough documentation. Different recovery methods may mean different packing out practices and supplies. Commercial records recovery services will probably recommend and sell appropriate containers. Use the following if you are "on your own" or using a public or private service that does not have specific container requirements:

- **Freezing**: If the goal for some or all records is stabilization and/or recovery by freezing, it is preferable to pack records in plastic crates that have ample holes for air circulation which hastens freezing and drying. Cardboard boxes are satisfactory for minor water (edge) damage.
- **Cleaning mud and debris**: Plastic crates always.

- **Storage**: Undamaged records destined for temporary storage should be boxed in standard 1 cubic foot records storage boxes. Avoid use of odd size boxes not designed for record shelving or not stackable on moving pallets.
- **Thermo-vacuum deodorizing and fumigation**: Either plastic crates or boxes.
- **In-house air or interleaf drying**: The container depends on the degree of water saturation. Cardboard boxes are satisfactory for minor water damage. Plastic crates are preferable for saturated records, as seepage from the files to cardboard container may create sufficient weakness to cause the container to collapse.
- **Microfilm** and other photographic negatives should be put into five-gallon barrels filled with clean cold water and transported that way to a re-processing facility. Once wet, film should never be allowed to dry out. If it does, emulsions separate and adhere to an adjacent film base.
- **Files**: Place folders in boxes located _____ (give locations). Place the folders vertically in boxes (standing as they would in a file drawer). Do not fill boxes completely to allow for swelling. However, don't allow the folders to slump or slide down within the box.
- **Bound volumes**: Load into boxes for transport. Place normal-size volumes in a "spine-down" position. Pack large volumes flat in the boxes. If time allows, loosely place sheets of freezer paper or waxed paper around every volume (or every other volume). Enough space should remain in the packed boxes to allow for swelling. Don't permit volumes to become bent or distorted in packing or transport.
- **Microforms:** Place in cool, clean water until ready to transport for reprocessing. See further details in the "Recovery Priorities" section that follows.
- **Photographic materials**: Most can be left in cool, clean water for a few hours until ready to dry or reprocessing. See further details in the "Recovery Priorities" section.

Note: As a rule of thumb, unless otherwise stated, cardboard boxes are preferable from a packing, labeling, cost, and storage viewpoint.

To move materials within the building during pack out, use hand trucks, utility carts, or dollies located _____ (give locations). Metal hand trucks and utility carts are preferable. If only wooden ones are available, they should be well covered with heavy plastic sheeting to prevent damage to their finish.

If possible, loosely sort materials according to the degree of wetness (soaked, damp, or dry). Pack like materials together — e.g., damp records or volumes in one box, soaked ones in another, and so on.

If using cardboard boxes, do not stack more than four boxes high. The boxes can be stacked on pallets and the pallets can be shrink-wrapped to prevent slippage during transportation. Pallet jacks or a fork lift can then be used to move the pallets onto trucks or to the drying area.

C-4-3 Labeling

Each box or crate should be labeled. Labeling may be comprehensive and include all the inventory information such as records series title, dates, office location, etc. It can also be a simple control number assigned to the box in a database or box listing sheet. Use water proof markers to label boxes and plastic tags for plastic crates which have limited space for writing. (See Appendix C for additional instructions for "Packing Out.")

C-4-4 Recovery Tracking System

For inventory control as well as insurance purposes, it is necessary to know the condition and disposition of records, especially if they are being transferred to a contracted restoration service provider. Record the following information:

- What records were destroyed in the disaster?
- Which records need to be removed or replaced?
- Which records were unharmed or sustained only minor damage?
- Which records were damaged but are salvageable?

As materials are removed, one team member will label each container with a brief notation of its contents and original location (by shelf or file name/number range; by cabinet/drawer; by record series; etc.). Indicate the damage (e.g., "wet," "dry," "smoke," "mud," etc.), salvage priority, and, if time allows, the volume (number of volumes or archives boxes) inside. If materials are going to different areas (e.g., some to the rinsing stations, others to an air-drying area, and some to a freezer), also note the destination of each container.

If there are many boxes, give each a brief unique designator code (e.g., floor/section designation and box number), then provide the detailed information regarding contents, damage, and priority on an inventory/packing list and/or in a tracking system spreadsheet. Throughout the salvage operation, it is useful to also document various decisions made (particularly the decision to discard) and who made/authorized them. This may be the responsibility of the _____ (name an individual/position).

The photographer should take photographs or videotape the salvage operations to document the recovery effort.

C-4-5 Removal

If elevators are working and conditions permit their safe use, they may be used. If not, the following strategies may be used: use of "human chain," laying plywood on stairs to create ramps for sliding boxes down, sliding boxes out windows onto ramps, and removing boxes out windows into dumpsters suspended by cranes.

C-5 Records Recovery Treatment Procedures

C-5-1 Rinsing and Cleaning:

Some records may need cleaning after a disaster. Materials may be rinsed before drying or freezing if they have been subjected to mud, sand, or other dirty deposits, and if adequate personnel and time are available for the rinsing work. The objective of the cleaning is not to make the materials pristine, but to remove gross deposits.

Select an appropriate area for the rinsing operations. It may be a loading dock, parking lot, or outdoor area. Key requirements are that it have access to running water, and have good drainage or be sloped so that water does not stand in the area. Specify here the areas that seem most likely to be suitable:

Personnel working in the rinsing area should be provided with rubber boots and gloves and waterproof clothing. If the water has been contaminated by sewage, workers will have additional protective gear as recommended by the safety officer.

The rinsing stations may be set up in either of the following ways, depending on the type of rinsing that is needed:

- Wet records covered with mud or debris can be washed before being sent for drying. If there is edge mud or debris they can be lightly sprayed while in plastic crates. The spray will remove most of the debris which will drain out of the crate. If entire documents are covered they can be bathed in a shallow pan and literally hung out to dry. (See Appendix C-3-4)
- If mud deposits are so light that a single brief rinsing will remove them, each station may consist of one garden hose with a spray nozzle.
- Rinse individual folders or volumes one at a time, holding the folder/volume tightly closed to avoid transferring dirt between the pages.
- If mud deposits are heavy:
  - Set up a series of 3-8 large plastic garbage cans.
  - Have a garden hose running into each can, with the nozzle resting at the bottom, and turn water on to provide a slow but continuous flow into each one.
  - Workers will take each item to the first can, hold it firmly closed and immerse it, move to the second can and immerse the item, and so on through the line.
  - Keep a supply of sponges at the last can, so mud can be dabbed off there.
  - The last station will have a hose with spray nozzle so the workers may rinse materials under a fine spray.
  - Gently squeeze excess water from volumes or folders.

Do not attempt to remove mud or stubborn stains during the rinsing process. This would significantly slow down the operation.

The same procedure may be used for photographic materials, except that shallow dishpans or photo processing trays may be used instead of garbage cans.

Never use these rinsing techniques on records with soluble inks (watercolors and many manuscripts), animal skins (leather, vellum, or parchment), or works of art on paper. Always “test” the ink first by wetting one character or word to see if it “feathers.”

Once materials have been rinsed, they may be transferred to the air-drying area or packed for transport to a freezer or drying facility as outlined in the packing instructions above.

C-5-2 Freezing

Freezing may be used as a stabilization technique for wet records. It should be used whenever records cannot be dried within 48-72 hours, because records left wet and at normal temperature beyond that time are at great risk for developing mold. In addition, bound volumes do not continue to swell and inks do not continue to diffuse once frozen.

In a medium- to large-scale disaster, freezing buys time for the organization. Once the materials are stabilized by freezing, funds can be obtained, drying options and vendors can be evaluated, and the staff can take a break after the difficult work of response and pack out. There is no limit on the amount of time that materials may be left frozen. In fact, paper will dry over time in a freezer.

Bound volumes and paper records are suitable for freezing. In a large-scale disaster, microfilm and most other photographic materials can be frozen also, though that is not

ideal. Historic photographs (such as daguerreotypes, tintypes, and ambrotypes) should never be frozen.

Cold storage companies are in most cities and public port facilities often have cold storage facilities. A cafeteria or restaurant may have a walk-in freezer available for small to medium quantities. As services are contacted, be aware that state and other health regulations may restrict the storage of records and books with certain foodstuffs. In a pinch, a home freezer can be used; those that are self-defrosting work best.

In an area-wide disaster such as floods or severe weather a local freezer facility may not be available. In that case, a refrigerated truck for transporting materials to a remote facility or for temporary cool storage on-site may be used. While it will not freeze the materials, it may keep them cool enough to slow mold growth.

The plan should describe:

- What freezer facilities have been identified, with the name of a contact there and phone number for after-hours emergencies
- Arrangements for transporting materials to the freezer facility, whether using personal vehicles or a trucking service

C-5-2-1 Coated Stock: Water Damage

Coated stock, books and magazines, photography of value should be frozen right away. Do not try to air dry. Employ a professional conservator to treat these materials.

C-5-3 Drying

Most damage to records is due to water. There are six or more common methods of drying water soaked records ranging from interleaf drying to vacuum freeze and desiccant air drying. See Appendix E for descriptions of each and their advantages and disadvantages Procedures for two methods, Interleaf and air drying, are detailed here because they are the two that require hands-on action by the Disaster Recovery Team and other city staff, and thus require the greatest knowledge and training. The other methods are most often done by contracted services with less participation by the team or city staff.

Wear disposable rubber gloves to prevent dirt and oil from skin from getting on the records.

C-5-3-1 Paper: Water Damage

The greatest damage to paper from water is done during the first 8 hours after a disaster. It is essential to begin restoration immediately after assessing the damage and stabilizing the area. Only small collections that can be dried within 72 hours should be restored without prior freezing. Collections larger than three file drawers or 30 to 50 books should be frozen as there will likely be neither staff nor space to process them.

C-5-3-1-a Interleaf Drying

This method is ideally suited to emergencies involving a small number of records in an environment where the temperature and relative humidity are low, avoiding an environment which can harm the records.

Make sure the area for drying is large and clean with adequate security and that it has proper temperature and humidity controls.

Method:

- In a safe recovery station, set up tables and cover them with clean unused newsprint or other blotting materials (i.e., blotter paper, paper towels, cotton rags, florists non-colored waxed paper).
- Remove the records from the damaged area using plastic crates.
- Remove the folders from the plastic crates. Remove the records from the folders, and discard fasteners and file folders. Folders do not dry well or will warp. It is best to create new folders. Be sure to write down information from the folder tab prior to discarding it. Keep the records in the order found in the folder.
- Place the individual records on the table. Use some sort of identifying mark in between file folders so that the records will be returned to the correct folder after being dried.
- Change the blotter paper regularly.
- Remove the records when they are totally dry, usually 30-48 hours. Return all the records to their proper files ensuring that reused file folders are not damaged.
- TIP: If the wet sheets are difficult to separate, use a sheet of polyester (Mylar). Mylar is considered a polyester sheeting since it will create an electrostatic charge. An example of Mylar found in everyday use is overhead projector sheets. Mylar sheets can be purchased at any office supply store. Place a sheet of Mylar on the top of a stack of wet paper and gently lift. Place the document on the table, and when it has partially dried, remove the Mylar. Several sheets of Mylar will be needed. Remove the Mylar as soon as possible to allow air to circulate over the paper to dry it more quickly.

C-5-3-1-b Air Drying

There are several methods of air drying.

- Use large flat surfaces such as folding tables.
- Spread blotter paper on the tables and place wet documents on top. This method is faster than interleaf paper but requires huge amounts of space.
- Loosely place documents in file sorters. This method takes less space than using tables but is slower.
- Clothesline or fishing line may be used to dry papers. Hang the line between two objects and clip the documents to it. Use plastic clothespins to hang records - wooden clothespins will retain water. This is a good way to dry brochures and pamphlets. Only use this method on paper if a small section of the paper is damp. Do not hang extremely wet records as they are fragile and may pull apart.
- Shallow baking trays or screens may also be used for drying. Cover the bottom of the tray/screen with blotter paper so the records will not stick to, nor take the shape of, the pan. Pans can be stacked to allow larger numbers of records to dry at the same time.

Some items, such as blueprints, maps, etc., will need professional work due to the fragility of the paper used to print them and due to their size.

C-5-3-2 Books: Water Damage

Books can be treated the same way as loose paper, except for positioning.

- Set up tables in recovery area. Cover them with absorbent material.
- Remove books from damaged areas using plastic crates or heavy cardboard boxes.
- Lay books flat and interleaf using newsprint, paper towels or other available absorbent material. Replace absorbent material frequently until book is dry, or
- Stand books upright on absorbent material, open each book with boards at a 90-degree angle and “fan” pages, separating as many as possible. Repeat fanning process every half hour to hour until dry.
- After a few books are dry stack them and apply light pressure. This may help reduce wrinkled pages and warped covers.

C-6 Recovery from Fire Damage

(Materials involved in a fire are likely also to suffer water damage.)

- Treatments for fire damage apply to both records and books.
- Records and books which have both fire and water damage should be dried first and then treated for fire damage.
- Records and books that are not wet and only charred around the edges or damaged by soot will not need immediate attention.

C-6-1 Treating Charred Records and Books

- Charred, sooty or mold covered wet records should not be cleaned until returned from drying. Attempts to do so will result in smearing, making the matter worse.
- Dry or dried, charred, sooty, dusty documents or documents covered with dead mold residue after drying can be cleaned. Use a “Hake brush, very soft dry cloth towels (like diaper cloth) and clean outward from the center of the document. A low negative pressure vacuum cleaner with soft brush head or, for charred records, a brush head with a loosely woven cloth cover can also be used with caution.
    - Set up clean work tables and cover with disposable material such as news print.
    - Remove records gently from damaged area using plastic crates or boxes.
    - Remove documents from file folders. Copy all information from folder tabs. Keep documents in the order that they were in the folder. Do not mix items from different folders.
    - Handle carefully as burnt or charred paper will be brittle and is easily torn or may crumble.
    - Gently clean records with a Hake brush or soft chamois cloth. Moving the brush or cloth from the center of the page to the edges will help avoid tears and will allow dust and charring to fall away from the document.
    - If the records are badly damaged, copy using a flatbed copier or microfilm machine.
    - If records are only coated with soot, and not actually charred, they can be cleaned with a low suction vacuum cleaner.
    - Return records to new folders after treatment.

C-6-2 Burnt Material

Damage caused by extremely high temperatures is irreversible; however, the information from severely burnt records can often be read by photography using an ultraviolet light. This procedure is expensive and should be reserved for only the most valuable information. These methods usually are carried out only in forensic science laboratories and are available only in exceptional circumstances. In the absence of professional help, no attempt should be made to open charred bundles, for such handling will result in further damage.

Even if materials are not charred beyond recognition, exposure to high temperatures will cause the paper to become extremely brittle. Such records should be evaluated. Some may be discarded, and others may be microfilmed or photocopied to preserve the remaining information.

If edges of bound volumes are charred or badly smoke-damaged, they can be sent to a library binder, who will remove the binding, trim the edges of the paper, and rebind the volumes. A list of certified library binders is available from the Library Binding Institute (see Appendix D -- Supplies and Services). Others may be found in the Yellow Pages or internet.

C-6-3 Smoke and Soot Deposits

If smoke and soot is deposited on the edges of materials, they can be treated in the following ways:

- Treat the materials in-house, using “chemical sponges” (pure latex rubber sponges) to remove the soot particles from the edges of volumes and documents. Use gentle sweeping motions, moving from the center out to the edges of the document.
- A professional document conservator should evaluate archival, fragile, or specialized records before employing any general-purpose soot and particulate removal techniques.

C-6-4 Smoke Odor Removal

Professional companies can deodorize fire-damaged paper records. There are two major options. Some companies essentially "perfume" damaged materials to mask the odor. Many such companies can be found in the Yellow Pages under "Smoke Odor Counteracting Services."

Materials may be treated in a thermo-vacuum or an ozone chamber. Ozone more effectively neutralizes the odor. However, ozone is a powerful oxidizing agent that irreversibly accelerates the aging of paper, so it generally should not be used on archival or intrinsically valuable records. Thermo-vacuum systems will also eliminate smoke odor.

When dealing with fire damage to special materials (art works, photographs, magnetic media, etc.), it is best to consult a conservator or other specialist.

C-7 Recovery from Contamination

- Do not attempt recovery of any contaminated records until it is positively identified.
- Contact the local health department, State EMD (see Emergency Contact Numbers, Appendix A-9). EMD will contact the appropriate state departments such as Health, Ecology or Labor and Industries.
- Contaminated records can be recovered without outside intervention provided it is deemed safe. Recovery crews should wear disposable rubber gloves. Face masks are necessary if fumes are present.
- Recovery of contaminated records most often means electrostatic copying or microfilming as contaminants are difficult to remove entirely, leave stains and residues which will accelerate disintegration of papers and films, and may transfer to adjacent documents when refiled.
- If contaminants leave residues, follow the procedures for cleaning and rinsing.
- If the contaminants is deemed injurious, a decision must be made to either destroy the records or call in a professional recovery company experienced in contamination problems.

C-8- Recovery Procedure for Microfilm, Photographic Film

C-8-1 Microforms Recovery

Microforms subject to water damage should be professionally cleaned and dried within 48-60 hours. Generally, this involves the use of a service bureau that will rewash, process, and dry the film. In most cases, the film should not be used again, but a duplicate copy should be made and the damaged one discarded. Coordinate microfilm salvage with service bureaus and processing laboratories

C-8-1-a Microforms Recovery Priority

- Color microfilm is most vulnerable. If the film is important, it should receive high-priority attention.
- Silver-gelatin and other emulsion film, while relatively stable, should generally be salvaged next.
- Diazo and vesicular films are duplicates and should be replaceable, moreover they are most stable and should generally be salvaged last, if at all.

C-8-1-b Microforms Recovery Procedures

- Fasten a rubber band around the box so the box, label, and roll will remain together.
- If the film is dirty or muddy, put in a 5-gallon bucket filled with clean, cold water, and agitate lightly to remove major dirt deposits.
- Drain off water. Replace with fresh water that is clean (preferably distilled) and cool until ready for packing.
- Observe the film brand identification on top of each film carton. Kodak film can be packed for delivery to Eastman Kodak Company, and Fuji Film can be packed for delivery to Fuji Film Company, since both provide no-cost salvage of their film. State Archives Imaging Services Section will also clean and dry film. Commercial microfilm labs will clean and dry film for a fee.

- Pack wet or damp reels of film in boxes lined with three layers of heavy duty plastic garbage bags (10-gallon size). Fasten each plastic bag separately and seal all boxes, marking them WET FILM FOR REWASHING & DRYING. Each box may contain 40-50 reels of 35 mm film (about 80-100 reels of 16 mm film) with a maximum weight of 35 pounds.
- Prepare and enclose a packing list in the container, and retain a copy of it.
- Arrange for shipping via UPS, Federal Express, or other carrier, and be sure the service bureaus know to expect the delivery.

C-8-2 Microfiche

If the fiche is a duplicate and replacements are readily available, do not attempt salvage. If salvage is required, follow these steps:

- Keep the fiche in clean, cool water until ready to salvage.
- Set up small buckets, shallow dish pans, or photo trays with clean, cool water.
- Dip the fiche in the series of water baths to rinse off dirt, mud, or other debris.
- Hang individual microfiche sheets on clothesline to dry. Be sure clothespin is attached to edge of sheet and does not contact the image area.

Freezing

If film cannot be salvaged within about 60 hours, it can be frozen.

C-9 Computer Media

Special procedures for protecting computer media are outlined in Appendix B-4 – Backing up PC's. The best procedure for recovering information recorded on computer media is to use the backups to recreate whatever data and files were on the affected media. If recovery techniques described here are attempted, never put the affected or damaged media in one of the newer or better machines, as the equipment could be damaged. If in doubt, always consult a data recovery specialist.

C-9-1 CD-ROM and Optical Disk

- Rinse in cool, clean water.
- Dry with a very soft, non-abrasive sponge. To accelerate drying, use a blow dryer turned to the "cool" setting.

C-9-2 Hard Drives and Magnetic Tapes

To the extent possible, use backups stored off-site. If salvage is required, contact specialized companies.

C-9-3 Diskettes

The objective in salvaging diskettes is not to save the diskettes themselves, but to allow you to copy data from a wet disk to a new one.

- Remove the disk from its plastic casing.
  - 3½" diskette: Gently pry up the metal "door" and remove the diskette inside. A spring will be visible, and it needs to be removed (it comes out easily as it is held in place by the metal "door"). The plastic disk will now be visible. Using a micro-spatula or thin screwdriver, slide the end in slightly so as not to touch the

magnetic medium, and pry open each end to break the plastic seal that holds the two sides together.
    - 5¼" diskette: Use scissors to cut off the very edge of the diskette housing so that you create an opening on the edge of the diskette that faces outward when it is in the disk drive.
- Reach in (using clean hands or lint-free gloves) and remove the magnetic medium.
- Gently rinse the magnetic medium in clean, cool water. Several rinses may be required, if the disk was in dirty water. Wipe with a lint-free cloth.
- Open a new diskette, using the procedures outlined in step 1. Remove the magnetic disk from within the casing. Place it into the new case. When recovering 3½" diskettes, you do not need to reattach the metal "door" or spring, but be sure the plastic fits snugly together so it does not get jammed in your disk drive.
- Insert the disk into the floppy drive of a PC. It is a good idea to use an older PC, in case the disk still has some dust or other defects that could damage the disk drive.
- Copy the damaged disk onto a new diskette.
- Remove the recovered magnetic medium and discard it. You can then continue using the diskette housing for recovering information from additional damaged diskettes.

C-10 Post-Disaster Restoration
After records have been recovered, some further restoration work may be required before they can be re-filed, re-shelved or returned to other storage locations.

C-10 1 Repair
Some records may need and deserve repair. Papers can be torn or have jagged edges resulting from charring. The first rule of repair is: Do not use adhesive tape to repair valuable records. Many tapes contain chemicals harmful to paper. They are also difficult and expensive to remove. All repairs of permanent, historical and intrinsically valuable records should be repaired using only reversible and non-damaging treatments archival treatments. Professional paper conservators should be employed for this purpose, or at least consulted, unless a member of the staff or volunteer is technically trained for this work.

C-10-2 Storage:
Records that have been water-damaged or mold-infested should be kept apart from other records for at least six months in a well-ventilated area having good climate control (65 degrees Fahrenheit and 35-45 percent relative humidity). The following locations may be used for this purpose: _____ (specify locations).

C-10-3 Assessment: _____ (specify the responsible position/person) will evaluate the records and decide on the next steps. See outline procedures below. Note: These are primarily records management decisions and actions and therefore not delineated in this manual.

- **Disposal:** (Specify who has legal authority to order the destruction of records, what record-keeping must be done, and where or how records will be discarded. City records coordinators should be contacted. The Archives and Records Management Division may also be contacted for guidance. Remember that there are Oregon

state statutes and codes that establish requirements for retention, maintenance, and security of government records.)

- **Reprocessing and Duplication:** (Specify procedures and responsible staff.)
- **Replacement:** (Specify procedures and responsible staff.)
- **Repair:** (Specify procedures and responsible staff.
- **Re-housing:** (Specify procedures and responsible staff.)
- **Re-labeling and Shelf Preparation:** (Specify procedures and responsible staff.)
- **Re-filing and/or Re-shelving:** (Specify procedures and responsible staff.)

C-11 Post Disaster Briefing and Evaluation

After the records recovery operations are complete, evaluate the operation of the Disaster Preparedness and Recovery Plan. Talk with those involved.

- Were they sufficiently prepared?
- Did the plan work?
- How could it be strengthened?

Revise the plan accordingly. Remember to thank those within and outside the organization who assisted in the recovery operation.

D APPENDIX – RECOVERY SUPPLIES AND SERVICES

Appendix D discusses the value of stockpiling response and recovery supplies, and provides procedural templates for maintaining a stockpile and contacts with service providers and suppliers.
It offers a checklist of the most commonly used supplies in response and recovery, and contains a name and address directory of national and regional service providers and suppliers.

D-1 Disaster Supply Stockpile -- Concept

Limited disasters (emergencies) plague organizations on a regular basis: roofs leak, air-conditioning systems malfunction, pipes leak and drains back-up. Most limited emergencies are water-related, but mold and mildew outbreaks are also a constant threat.

Quick response can make the difference between a minor annoyance and a costly event. The faster records are stabilized, the less damage there will be. Having a disaster supply stockpile on hand allows staff members to begin responding immediately.

The following “Disaster Supply Stockpile” template is a checklist of materials needed for a limited water and fire disaster involving 12 to 16 cubic feet of records. Most of the items are readily available from local hardware, grocery, and drug stores. A few more specialized items may be purchased from archival, conservation and recovery suppliers generally located out of state.

Agencies prone to major area-wide disasters (such as earthquakes and floods) should plan for a greater level of self-sufficiency by stockpiling additional specialized supplies that cannot be easily obtained locally.

Decide where and how to store the supplies. Avoid areas that are most susceptible to leaks or flooding; this generally includes the basement. Interior closets are often good candidates. Some organizations divide the stockpile, storing two or more identical kits in different areas of the building as an added precaution.

Store the supplies in sealed, waterproof containers so that even if there is some water in the area, the kit will be intact. Some recommend storing supplies in a 20- to 30-gallon heavy duty plastic garbage can (those with wheels are helpful), which can be transported easily to the site, and may have additional uses for debris removal. Some institutions put the supplies in plastic crates, each shrink-wrapped in plastic and secured onto a dolly or hand truck.

Keep a copy of the stockpile checklist in each Disaster Preparedness Team member packet, showing the location of supplies and equipment kept elsewhere (e.g., mops, fans, dehumidifiers) and providing instructions on how to access storage locations. All members of the team should know the location of the stockpile.

It may be impractical to include some bulky or expensive items in the stockpile. Equipment such as dehumidifiers, fans and small tools may have to be borrowed from the city maintenance department or other source. Arrangements for their use should be made ahead of time.

Creation of a large stockpile to handle major disasters may require storage of some of the more cumbersome equipment (generators, dehumidifiers, and so on) outside the building. Some public agencies can use a city or county warehouse for this purpose. Be aware of how to get access to these areas, and inventory off-site supplies and equipment regularly.

D-2 Disaster Supply Stockpile Policy and Procedure

To ensure fast and effective response to emergencies, the city maintains a stockpile of disaster recovery supplies. This section lists those supplies and their storage locations.

Include the following paragraph to designate where supplies are kept outside the building — for example, in a central warehouse or supply depot:

The location designation _____ (insert abbreviation or code) refers to the facility located at _____ (insert exact street address, floor, etc.). To get access to this facility, contact _____ (name individual(s) who authorize and provide keys or access to the location, including office and after-hours phone numbers.) If this person is unavailable, contact in the following order:

Name/Title	Office Phone	Home/Cell Phone

Note the frequency of inventories and who is responsible for conducting them.

D-3 Records Disaster Recovery Supply Stockpile List

The following list of supplies provide for a relatively small emergency that includes bound materials, paper documents, and photographs (including microfilm).

The "Quantity Needed" column represents the minimum for recovering materials in a small water emergency (e.g., with about three - six file drawers or 12 cubic feet of damaged materials) when utilities are not disrupted.

The WEB version of this template contains expanded lists of supplies for medium and large disaster. As part of planning, determine the scale and types of disasters for which to prepare and increase the quantities accordingly. Depending on the type of situations anticipated, some of these supplies may not be needed.

SECTION 1. SUPPLIES FOR PEOPLE

ITEM	LOCATION	QUANTITY NEEDED	QUANTITY PRESENT	DATE CHECKED
Boots, rubber		1/person		
First aid kits		1		
Gloves, latex or rubber		3/person		
Dust/Particle Masks		2/person		
Protective clothing		1/person		

SECTION 2. RESPONSE SUPPLIES

ITEM	LOCATION	QUANTITY NEEDED	QUANTITY PRESENT	DATE CHECKED
Hand trucks and utility carts or dollies		1		
Camera (digital, Polaroid)		100 exposures		
Clipboard		1		
Duct tape		2 rolls		
Extension cords, 50-foot, grounded		2		
Flashlights, batteries, replacement bulbs		1 per dept.		
Garbage bags		1 box		
Labels, adhesive		Box of 20		
Lights, shop, and bulbs		1		
Markers, waterproof		4		
Note pads		1		
Paper towels or wipes		1 carton		
Pens and pencils		4		
Plastic sheeting		6 rolls		
Scissors		1		
Tape, filament, dispenser		4 rolls		
Utility knives, extra blades		1		

SECTION 3. RECOVERY SUPPLIES				
ITEM	**LOCATION**	**QUANTITY NEEDED**	**QUANTITY PRESENT**	**DATE CHECKED**
Alcohol, rubbing				
Blotter paper		50 sheets		
Book press		1		
Boxes, cardboard record/file storage*		10		
Boxes, polyethylene*		10		
Bread trays, plastic				
Buckets (for rinsing)		3		
Clothesline (nylon or 30-lb. monofilament)		100 feet		
Clothespins, plastic		100		
Dehumidifiers		1		
Fans		1		
Freezer bags, 1-gallon		50		
Freezer/waxed paper				
Garbage cans, plastic, 20- to 30-gallon				
Garden hoses, nozzles		1		
Interleaving paper (un-inked newsprint, or paper towels)		400 sheets		
Plastic crates*		10		
Mylar sheets, 3-mil, 12", 15"		25		
Photo trays or shallow dish pans (for rinsing)		3		
Tables, 6-ft., folding		2		
Temperature/humidity monitors and batteries[23]		1		

*Interchangeable with polyethylene boxes, plastic crates or cardboard boxes.

[23] Describe products/services available, payment terms, and any special arrangements, unique features, limitations, or other conditions.

D-4 Supply and Service Providers

Identify emergency service providers, suppliers and other resources needed in a disaster situation. Make these contacts before confronting disaster, when suitability of a service or product can be evaluated and an understanding with the provider can be established.

As each firm is contacted, address the following points:

- Availability: Explain what resources might be needed and find out what services, equipment, and/or supplies are available and at what price. Will it be possible to contact the provider and acquire the resource outside normal business hours? What is the expected delivery time of materials or services?
- Payment Terms: Will the provider accept a standing purchase order, credit, or make other arrangement for after hour access to the resources available?
- Contacts: Ask the provider to supply the names and phone numbers of after hour contacts. Let the supplier know which city staff are authorized to call for help.

Geographic proximity may be irrelevant when identifying qualified recovery and restoration services, particularly for the more technical services such as vacuum freeze-drying, on-site dehumidification, or video restoration. A few national companies have developed an understanding of the needs of government records and archival materials and have developed sophisticated services to address those needs. Many have mobile equipment and teams that can be on-site within a matter of a few hours. Others have developed ways to facilitate shipment of damaged materials.

Providers should understand and support your needs. Renew contacts annually. This facilitates learning of new resources that may have become available and updating the contact information for your institution and the supplier

This section lists the sources of supplies and services that might be needed in a disaster.

Part A describes the uses and sources of supplies.

Part B describes specialized services such as drying, extermination and fumigation, fire damage restoration, freezing, and sources of information and referrals.

The institutional checklist should be organized to reflect each type of supply or service the following basic information:

Company: _____

Phone: _____ Fax: _____

Address: _____

Notes:[24] _____

Date of Last Contact: _____

After-Hours Contact(s): _____

Include multiple providers of suppliers locally, regionally, and nationally. If some of these supplies are kept in the in-house stockpile, note those locations.

[24] Describe products/services available, payment terms, and any special arrangements, unique features, limitations, or other conditions.

D-5 Supplies and Services

D-5-1 General Sources for Supplies

Appliance stores: fans, dehumidifiers, etc.

Archival and conservation supply stores, art supply stores: blotter paper, Remy and other specialized paper and fabric and book conservation and recovery supplies and equipment

Department stores: general purpose equipment such as folding chairs, tables, etc.

Drug stores: general purpose supplies, alcohol, first aid materials, safety supplies, etc.

Grocery stores: general purpose supplies such as cleaning products and supplies, clothesline and clothespins, freezer paper and waxed paper, garbage bags and cans, garden hoses, paper towels, rubber gloves

Hardware and home center stores: building materials, generators, tools, hoses, etc.

Janitorial service and supply stores: cleaning and disinfecting supplies

Office supply stores: various materials (clipboards, note pads, markers, labels, scissors, utility knives, etc.) that may be needed for recovery operations

Safety supply stores: personal safety supplies such as protective clothing, first aid kits, hard hats, etc. Local ones may be identified in the telephone book Yellow Pages under headings like "Laboratory Equipment & Supplies" and "Safety Equipment & Clothing"

D-5-2 Supplies and Uses

This section explains how disaster receovery supplies are used and provides some recommendations such as appropriate composition, types, and sizes.

Alcohol: to remove mold

Blotter board: to dry drawings and other oversized material

Book press: for pressing dry or nearly-dry bound volumes to reduce cockling and distortion of pages

Boots, rubber: worn by workers in wet areas

Bread trays: for stacking maps and oversized documents for transport and air-drying. (can sometimes be borrowed from bakeries)

Buckets, large: to keep microfilm and other photo materials wet until reprocessed

Camera: to document disaster conditions

Chairs, folding: for work stations

Chemical sponges: to remove soot from edges of bound records

Clothesline and clothespins: for air-drying pamphlets, photographs, other materials

Clothing, protective: see "Safety supplies" and "Hardware." Provide clothing to insure worker safety during salvage operations (May include dust/particle masks, work gloves, rubber/latex gloves, hard hats, rubber aprons, rubber boots, and “Tyvek" coveralls.)

Containers, cardboard record storage: for packing and removing undamaged records from disaster site to temporary storage. Cardboard boxes should be 200-lb. test and stocked in two sizes: 1 cubic foot (12" x 15" x 10") and 1.5 cubic foot (12" x 18" x 12").

Containers, plastic crates: for packing damaged records destined for cold storage and freeze drying

Dehumidifiers (portable and industrial): for reducing humidity in rooms and buildings, particularly when normal air-conditioning is unavailable

Dry ice: to keep materials cool during transport or while awaiting transport

Fans, industrial: to increase air circulation, particularly in spaces where records are being dried, as air movement increases evaporation and reduces the risk of mold

Freezer bags: to separate wet bound materials going to cold storage

Fungicide: to treat mold-infested materials and spaces

Garbage cans, plastic: for cleaning or rinsing dirty materials and for storing and transporting materials and supplies.

Gloves, rubber or latex: to protect response and recovery workers from dirt and contaminates

Hand trucks, carts, and dollies: for transporting materials within the site and to transport.

Hoses, garden, and nozzles: for cleaning dirt/mud from material

Humidity and temperature monitors (e.g., hygrometer, hydro-thermometer, hydro-thermograph): to monitor temperature and humidity levels in rooms and facilities ensuring that they are sufficiently low for the return of record material

Labels, adhesive: for labeling boxes and other general purposes

Masks, dust or particle: for protection of workers against mold and particulates

Mylar: individual sheets used to separate wet paper documents (Available from conservation suppliers and sometimes from art supply stores.)

Newsprint, un-inked: for interleaving wet materials to increase evaporation. (May be available from local newspapers.)

Paper, blotter: for drying loose paper materials (see "Art supplies")

Paper, freezer or waxed: to separate individual volumes prior to freezing (see "Grocery, Hardware, & Home Center Stores")

Paper towels: for general cleaning and other purposes (Handwipes also work). May also be used to interleave bound volumes during air-drying.

Photo processing trays: for rinsing photographic materials, diskettes, and other small items; shallow dish pans serve the same purpose

Photographic supplies and processing: source of film and processing services that may be needed to document damage and recovery activities

Plastic crates: for packing wet/damaged records materials for transport (May sometimes be borrowed from dairy providers or grocery stores.) Note: ribs of these crates will cause wrinkling/distortion of wet paper files/documents, if used to hold, transport, or freeze them; correctly packed cardboard boxes are best for this.

Plastic (polyethylene) sheeting: for a variety of purposes: to protect shelves, cabinets, furniture, equipment from continuing threat of water; as temporary window covering; etc. 6-mil polyethylene is stronger, but 4-mil (the minimum acceptable weight) is less expensive. (Should generally be purchased in 100-foot rolls.)

Polyester, spun (e.g., Pellon and Reemay): for interleaving materials printed on coated paper (e.g., yearbooks, many art books) to prevent pages from sticking together.

Respirators: for use when mold or other biological contaminants are present - In case of dust, dust/particle masks are adequate

Tables, folding: for temporary work space or for air-drying operations. Size of 6' x 30" is recommended. (May sometimes be borrowed from churches, civic organizations, etc.)

Tape: May need duct tape (particularly if surfaces are wet), filament tape, tape dispensers, etc. for sealing boxes, affixing plastic sheeting over cabinets, shelves, etc.

Wet-dry vacuum: for removal of standing water.

D-5-3 Services

Cold storage: for temporary freezing and storage of collections while awaiting further decisions and action. Freezing will ward off the risk of mold and prevents further swelling and distortion of paper-based materials.

Conservator: provides advice on stabilization and salvage; performs conservation treatments on affected items. Conservators typically provide advice and treatment on only a specific format of materials. A paper and book conservator will be needed for records recovery, not a metal or textile conservator.

Data processing specialist: provides consultation on data processing functions, including restoration of equipment, recovery of software and data files.

Data recovery service: performs restoration of data on magnetic or optical media.

Dehumidification service: Several national companies and some local ones provide portable dehumidification equipment that can dry out buildings, furnishings, and collections on-site.

Equipment rental company: provides rental of maintenance, repair and other equipment. May also rent emergency/portable generators, heavy duty work lighting and power cables for use in temporary work/recovery areas.

Fire restoration companies may provide smoke odor removal for buildings and furnishings, deodorize and clean affected materials, trim soot-damaged books and arrange for rebinding.

Freeze-drying service: may provide vacuum (thermal) drying or vacuum freeze-drying of collections. It is important to know which method each vendor uses. Several national companies provide this service, using portable equipment and mobile salvage teams.

Fumigation service: treats mold-infested materials.

Magnetic media restoration: recovers and duplicates magnetic media including computer tapes, audio cassettes, videotapes, etc.

Microform restoration: cleans and duplicates microform materials.

Moving and relocation service: may be needed if operations must be moved to other locations.

Mycologist: assists in identifying source of mold outbreak and may assist in recommending treatments and evaluating fumigation services.

Smoke and soot removal: see "Fire restoration."

Space, drying: Off-site area in which drying operations can be carried out.

Space, office and storage: Off-site space in which routine office functions can be carried out or in which unaffected materials can be housed, if the building is unsuitable.

Trailer rental (cargo and mobile home/office): may provide off-site space in which drying or other operations can be carried out if the building is significantly damaged.

Trucking service: provides transportation of materials to off-site storage space, freezer facilities, or restoration services.

Trucking service, refrigerated: provides transportation of materials to off-site storage space, freezer facilities, or restoration services. Used when mold is a risk and warrants refrigeration or when previously frozen materials are transported.

Videotape restoration: cleans, stabilizes, and duplicates damaged videotape materials.

D-5-4 National and Regional Suppliers, Service Providers and Information Assistance Resource List

Due to the ever-changing nature of commercial and government recovery services, it is recommended that an internet search be conducted to find recovery services in the area.

Traditional archival, conservation and library suppliers carry many basic disaster recovery supplies such as Mylar, blotting paper, etc. Many catalogs may be accessed online or requested by letter or phone.

Other local resources may be identified online or through the Yellow Pages under headings such as: *dehumidifying equipment*. This includes firms that provide dehumidification services on-site and/or at their plants; *fire and water damage restoration*; *janitor service* for assistance with basic clean-up; *pest control services*, which will include fumigation as well as extermination; *smoke odor counteracting service* for firms that specialize in cleaning and deodorizing; and *water damage restoration*.

Before including any organization in the records disaster preparedness, response, and recovery plan's list of suppliers and service providers, contact the company to verify the information, identify a contact person, gather cost estimates, ascertain other specific terms, and evaluate their ability to provide the supplies and services needed.

Government Resources

Library of Congress
National Preservation Directorate
https://www.loc.gov/preservation/

National Archives and Records Administration (NARA)
Conservation Division
https://www.archives.gov/preservation/conservation-division.html

Federal Emergency Management Administration (FEMA)
Emergency Response Action Steps
https://www.fema.gov/office-environmental-planning-and-historic-preservation/emergency-response-action-steps

Northeast Document Conservation Center
Referrals on Conservation Treatment
http://www.nedcc.org

E APPENDIX – MEDIA TYPES AND RECOVERY METHODS

Appendix E consists of information on common media types and methods of recovery, emphasizing drying which is the most prevalent records disaster problem. (See the attached Decision Logic Charts)

Media Types

- **Plain paper:** Encountered everywhere in the office environment. Manufactured after the 1850's, usually highly acidic, frequently made of short fiber ground wood, disintegrates easily when either wet, or too dry.
- **Coated papers:** Glossy papers coated with clay, photographic, film emulsions or fillers. Examples: photographic papers, architectural and engineering drawings on "vellum" papers, magazines, catalogs, annual reports, lithographic and "thermo" treated papers. Leaves of such papers readily adhere to one another when wet or heated.
- **Rag paper:** Manufactured mostly before 1850, but on a declining scale even to the present day. Long fibered, very durable. Used for fine stationary, official documents, well bound books and other records used through the 19th century.

  Note: All paper has, or should have, a natural moisture content of 6 – 8 percent. Lower moisture content will cause the paper to become brittle and disintegrate.
- **Linen:** Not a paper, but a coated woven cloth, used through the mid-20th century, for architectural and engineering drawings. Cloth itself is comparatively durable, and is not damaged by water, but many coatings are water soluble.
- **Photographic films:** Most camera original photographic media consist of a plastic base coated with a silver halide emulsion. Examples of these are microfilm, X-rays, slides, motion picture and still photography negatives. Allowed to dry in contact the emulsions can partially adhere to the opposite film base. If heated above 90 degrees Fahrenheit, the plastic base will warp and the emulsion will become "tacky" and adhere to an adjacent base or another smooth surface such as glass or metal. (See Recovery of Microfilms, Films, Appendix C-3-9.)
- **Electronic media:** Magnetic tape, magnetic disks, optical disks, CDs, hard drives, thumb or zip drives, are all subject to damage. The best defense is prevention, including duplication and backup procedures. Electronic media can sometimes be dried and salvaged. Copy the information onto fresh media. Don't put contaminated disks into systems as further damage may occur to equipment. Drying and restoration are best left to information systems professionals. (See Electronic Records Backup and Recovery, Appendix B-4).

Drying Methods:
There are six commonly used drying methods and processes, each with an array of advantages and disadvantages. Some are preferred for drying specific type of media than others. (See Decision Logic Charts located at end of the Appendix.)

1. **Interleaving:**
   - **Description**: Document or book leaves are separated and then interleaved with absorbent paper, such as blotter paper or blank newsprint, then weighted. The absorbent paper draws moisture from the wet records. The absorbent should be replaced every 30 minutes until the documents are dry.
   - **Preferred** for small groups of mildly wet paper, clay-coated paper, and photos.
   - **Advantages**: Can be done by city staff and/or volunteers locally, in almost any available space with normal room conditions, 70-75 Fahrenheit, 50-55 percent relative humidity (RH). Easy to monitor. Materials stay "at home" and are accessible for reference. No over-drying and limits warping. Considered low-cost.
   - **Disadvantages**: Labor intensive. High mold potential.
2. **Air Drying:**
   - **Description**: Documents are backed with absorbent material and spread out on tables or placed in sorters to dry.
   - **Preferred** for small quantities of moderately wet paper materials.
   - **Advantages**: Can be done by city staff and/or volunteers locally, in almost any available space with normal room conditions, 70-75° Fahrenheit, 50-55 percent RH. Easy to monitor. Materials stay "at home" and are accessible for reference. No over-drying. Considered low-cost.
   - **Disadvantages**: Labor intensive. Requires large space and tables or shelves. High mold potential. Leaves are often warped and distorted and require flattening.

   Note: Interleaving and air drying are the oldest and most commonly used methods of drying. They are often thought to be the same process because they are often used simultaneously. The difference is that interleaving depends on absorption as the primary means of drying, while air drying depends on air circulation as the primary means. These methods are described in further detail in Appendix C-3-6.
3. **Desiccant Drying:**
   - **Description**: Initially used for drying out buildings, holds of ships and large containers. Employs large desiccant dehumidifiers that pump air into an area under specific air velocity, temperature and humidity (75-80° Fahrenheit, 20 RH), to take moisture out of the air, and, by evaporation, out of documents. Documents are placed on vertical wire racks to permit air circulation. Requires commercial firm.
   - **Preferred** for large quantities of most paper materials from slight to heavy water damage. Also preferred for photographic materials.
   - **Advantages**: Speed, can take as little as 20 days. Scalable to volume. Can handle large quantities. Records are accessible for reference. No over drying. Can be set up on-site by commercial provider. Does not require cold storage stabilization due to volume.
   - **Disadvantages**: Poor results with clay-coated papers. Mold may lay dormant. Considered expensive.

4. **Vacuum Thermal Drying:**
   - **Description**: Employs a vacuum chamber to batch dry materials at variable temperatures and vacuum levels which draws and expels moisture.
   - **Preferred** for moderate quantities, and smoke damaged materials.
   - **Advantages**: Effective non-chemical fumigation and smoke removal. Destroys mold. Can be done on site using portable commercial chambers.
   - **Disadvantages**: Poor results with clay-coated papers. Over-drying can occur. Not suitable for saturated papers, particularly books.

5. **Freeze Drying:** There are three options for freeze-drying, all of which employ "sublimation." Sublimation is the process of converting H2O in its solid state (ice) directly to its gaseous state (vapor), by- passing the intermediate liquid state (water). It functions exactly like a self-defrosting kitchen freezer, alternating freezing and heating to produce condensation, in combination with pressure to evacuate the vapor. The primary difference between the three is speed or rate of drying.

   - **Cold storage**-Primarily used for stabilizing wet materials to prevent further damage. However, it can also dry the records if left long enough, 4 to 24 months, depending on the level of saturation.
     - **Useful** for voluminous materials that are not required for extended periods of time and when funds for more costly methods are not available.
     - **Advantages**: Handles large volumes. Inexpensive. Damage stopped. Will not over-dry. Readily available in many locations. (Public ports often have huge cold storage facilities.)
     - **Disadvantages**: Very Slow. Access for reference difficult.

   - **Freeze Drying Chambers-Large:** (grocery store size) self-defrosting freezers, specially engineered to achieve temperatures below -50 F to produce ice crystals quickly and rapidly bring the temperature up to near thawing to effect sublimation of ice crystals. Vapor is removed by low level negative pressure.
     - **Preferred** for wide range of materials in small quantities, not needed quickly. Will kill mold.
     - **Advantages**: Damage is stopped. Medium cost, cannot over-dry.
     - **Disadvantages**: Limited capacity (under 12 cubic feet in most cases.) Not readily available from commercial providers. Slow; 1 - 4-month cycle, depending on saturation. Documents are not readily available for reference.

   - **Vacuum Freeze Drying**: Employs ultra-low negative pressure and supplemental heat resulting in **rapid** sublimation of ice crystals.
     - **Preferred** for coated papers and saturated books.
     - **Advantages:** Fast. Suitable for a wide range of materials. Greater capacity than freeze dry chambers. Will kill mold.
     - **Disadvantages:** comparatively expensive. Not available locally. Requires shipment via refrigerated carrier. Materials not readily available for reference. Over-drying can occur.

Factors to consider in selecting a method of drying:

- **Volume of Media** – Is the volume such that the records must be stabilized by freezing before being dried; or shipped via refrigerator carrier to a large drying facility out of state; or desiccation humidification systems used on site?
- **Type of Media** – Are coated papers, photographs, and linen drawings and books damaged that are best dried by certain methods?
- **State and Degree of Damage** – Is there fire, mud or contamination damage that requires cleaning the records before they are dried? How wet are the records? Completely saturated or just wet on one or more edges? Are records moldy?
- **Sensitivity of the Media** – Does the media have coatings or emulsions that may be salvaged only through certain drying processes?
- **Location of the Drying Facility** – Can the drying be done on site or does the material need to be shipped out of state to use the selected method?
- **Reference Accessibility** – Is access needed during the drying process?
- **Available Funds** – Cost may dictate what is possible.

Decision Logic Charts:

Figure 6-a and Figure 6-b, below are diagrams illustrating the decision process for responding to both small and large-scale disasters, especially in dealing with water damage. They show graphically how to select among the various drying/recovery options based on factors such as funds available, nature of the damage, recovery speed and the need for reference to the records during the drying process.

The diagrams are generalized. Decisions and actions may vary, depending on the specific nature of the disaster. The alternatives shown may be used in various combinations.

Figure 6a: Decision chart showing logic of selecting recovery/drying alternatives.

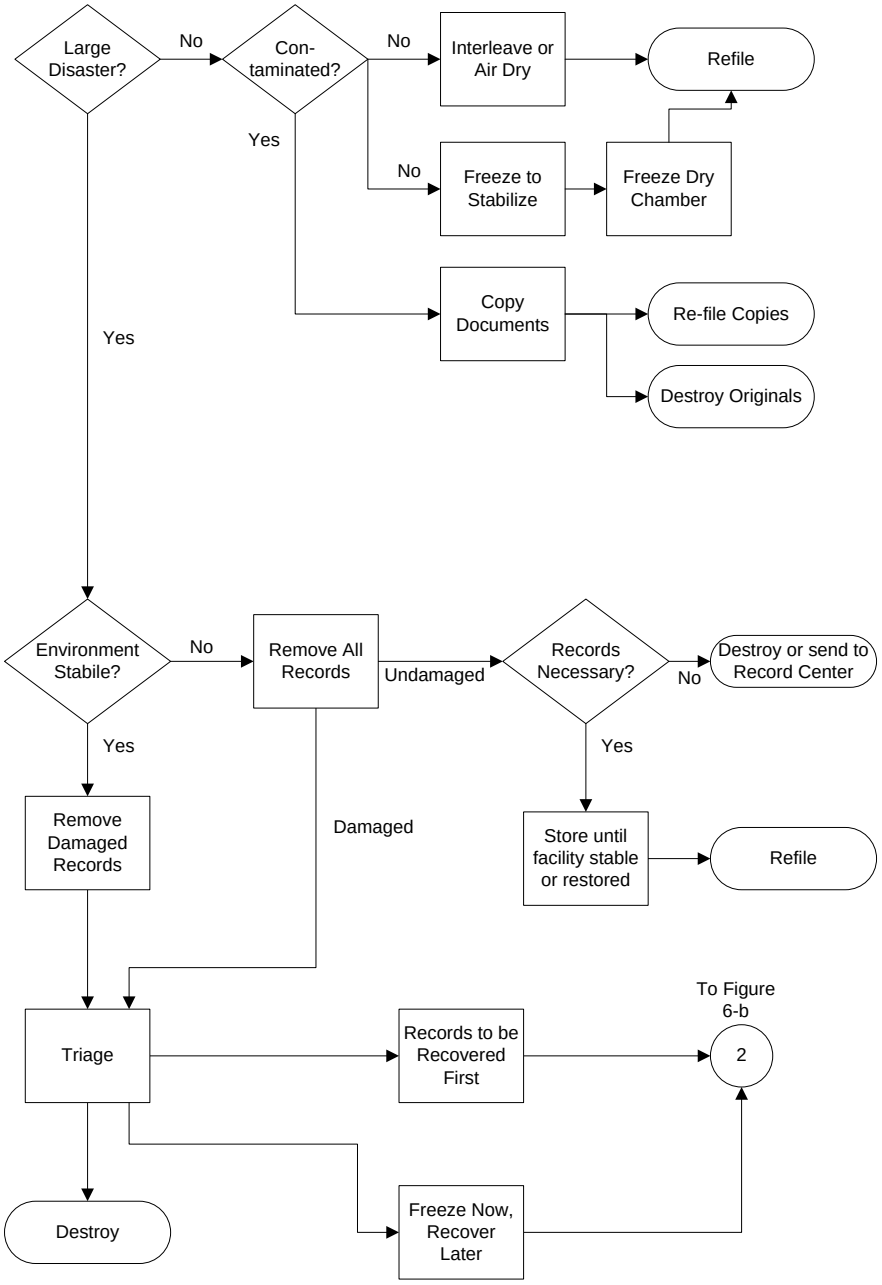
Small Disasters - One or two cabinets or a dozen boxes or less. Usually can be handled by agency staff.

Large Disasters - Dozens or hundreds of cabinets or boxes. Usually requires outside help such as temporary workers or disaster recovery firms.

A stabile environment means it is safe to enter and work in it. It also means environmental conditions such as humidity are normal.

If any of these conditions are absent, or if major repair or office rebuilding is necessary, all records may have to be removed.

Triage means dividing things into threes. Divide (1) Essential Records and other Important Records from (2) Less important records and (3) Records that are unnecessary or cannot be recovered.



Source: State of Washington, Secretary of State, Division of Archives and Records Management (https://sos.wa.gov/archives/pdf/complete_essential_records_manual_aug2903.pdf)

Figure 6b: Decision chart (continued from 6a above)