New York State Department of Environmental Conservation

DISASTER DEBRIS MANAGEMENT PLANNING

TOOL KIT FOR NEW YORK STATE MUNICIPALITIES

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EXECUTIVE SUMMARY

A key lesson learned from recent emergency response disasters including Superstorm Sandy, is that immediate response for debris collection and disposal is essential to a community's swift recovery from a disaster. The New Jersey Department of Environmental Protection developed guidance to assist municipal officials in preparing effective emergency debris management plans to aid in their recovery from disasters and have given the NYSDEC (Department) permission to use their guidance. This document was prepared using New Jersey's guidance as a model.

The Department strongly urges all municipal officials to conduct pre-disaster planning and prepare emergency debris management plans. We also recommend that these plans should be reviewed and updated annually. The guidance provided within this document provides a basis for preparing local disaster debris management plans.

Once a disaster strikes that generates significant volumes of debris, the Department recommends the following top five (5) actions to address debris removal:

1. Assess the type (e.g., vegetative and non-vegetative debris) and extent of the debris generated, as well as the need for Temporary Debris Management Areas (TDMAs). Contact the Department to receive approval for TDMAs, if needed.

2. Implement debris removal activities using either stand-by emergency debris removal contracts, the State's disaster debris contract vendors and/or public works personnel. Contact the County Office of Emergency Management's (OEM) Debris Management Coordinator if local capabilities are overwhelmed.

3. Coordinate support from county and State agencies to reopen road networks.

4. Communicate with residents and businesses to ensure public awareness and cooperation with debris removal efforts.

5. For Federal Emergency Management Agency (FEMA) reimbursement purposes, monitor debris removal activities and maintain careful and detailed records of municipal personnel activities; the amount of debris transported and disposed of; and the location and costs of transport and disposal.

Thank you to New Jersey Department of Environmental Protection
for allowing us to use these materials.

Contents

INTRODUCTION AND PURPOSE

After Superstorm Sandy struck, it was noted that municipalities with Emergency Debris Management Plans already in place cleaned up faster and more efficiently than those without plans.

This Emergency Disaster Debris Management Plan Tool Kit (Tool Kit) was developed to assist municipalities in planning for such disasters. The Tool Kit includes the:

- Department's Emergency Debris Planning Guidance Document;
- Department's Speed Up Your Cleanup handout and Garbage Collection Delay Fact Sheet;
- Guidance on estimating the acreage needed to temporarily stage collected debris;
- Frequently asked questions (FAQs) regarding storing debris in a TDMA;
- Guidance on perimeter controls for stormwater management; and
- Temporary Debris Management Area(s).

In addition to the information provided in this Tool Kit, the Federal Emergency Management Agency (FEMA) has numerous debris removal guidance documents on their website at:
http://www.fema.gov/pdf/government/grant/pa/demagde.pdf

There is also information on NYSDEC's website:

What to Do After a Flood – http://www.dec.ny.gov/lands/80429.html

Storm Debris Management Guidelines - http://www.dec.ny.gov/regulations/8751.html

Drought - http://www.dec.ny.gov/lands/5011.html

Invasive Species - http://www.dec.ny.gov/regulations/8751.html

Spills - http://www.dec.ny.gov/chemical/8428.html

DEC Regions - http://www.dec.ny.gov/24.html

This guide recommends separation of various types of disaster debris for better management, including recycling. However, we recognize that separation may not always be possible.

If you have any questions on the information contained in this Tool Kit or about debris management, please contact the Department's Material Management Division at (518) 402-8678.

SECTION I. PREPARING FOR DISASTER DEBRIS CLEANUP

This Tool Kit has been developed to assist municipalities in preparing for any type of debris generating disasters, but as the past has shown us, natural storms have been the most common debris generating disasters. Therefore, if you have not already taken steps to prepare for the next disaster, please consider taking the following short-term actions to ensure that your municipality is ready to manage the debris that may be generated.

1. **Estimate how much debris you might expect from a disaster.**

Many communities were surprised at the volume of debris created by Hurricane Irene, Tropical Storm Lee and Superstorm Sandy. To properly plan for a disaster debris cleanup, it is important to develop a good estimate of how much debris (in cubic yards) may be generated by a disaster. That will help you determine:

a. How much temporary debris storage capacity you will need (number and size of staging areas);
b. Staffing and equipment needs in your public works department or the structure of your stand-by debris contract; and
c. How much debris removal could cost.

This document provides a model to assist municipalities in estimating potential debris generation amounts. Guidance on using this model is in Appendix 3 of this Tool Kit.

As an additional guide, the following table sets forth Superstorm Sandy debris volumes reported by several municipalities:

Municipality	County	Population (2010 Census)	Non-Vegetative Debris (in tons)	Vegetative Debris (in tons)
New York City		8,405,837	700,000	27,000
Suffolk County	Suffolk	1,502,968	1,159,929.4	472,564.4

2. **Site and get Department pre-approval for one or more Temporary Debris Management Areas (TDMAs).**

The Department strongly encourages municipalities to act now to select areas that would be suitable for temporary staging of mixed disaster; construction and demolition and vegetative disaster debris. If you do not have room in your municipality for debris staging, this would be a good time to enter into a shared service agreement with one or more of your neighboring municipalities, or to work with your county solid waste planner to develop a regional TDMA.

Guidance on siting TDMAs is available in Section II of this Tool Kit.

3. **Identify/obtain debris removal and debris monitoring resources.**

You have several options for debris removal and debris monitoring services after a disaster:

- Utilize your municipal work force and municipal equipment.
- Obtain competitively bid disaster debris removal and debris monitoring contracts through a pre-disaster stand-by contract to initiate response and recovery immediately following a disaster.
- Some combination of existing staff and equipment and contractor assistance.
- Utilize State of New York cooperative purchasing agreements for disaster debris removal and debris monitoring. More information can be found at - http://www.naspo.org

Following Superstorm Sandy, some municipalities removed the most critical debris (e.g., debris blocking critical infrastructure) using municipal work forces, and then addressed the remaining debris using either their own competitively bid debris removal and monitoring contractor(s) or contractors available through State cooperative purchasing agreements. Some municipalities used contractors to remove the debris, but used their municipal workforces to monitor debris removal. Municipalities need to decide which method or combination of methods provides them with most efficient and cost-effective service.

4. **Educate your residents**.

It is important to educate your residents and businesses on what they can do to minimize disaster debris (e.g., bringing in outdoor furniture, decorations, garbage cans and anything else that is not tied down.) Useful tips on minimizing debris can be found at http://www.ready.gov/hurricanes

To expedite debris removal after a disaster, your residents should also know what kind of debris to put at the curb and how to separate the debris for collection. Segregating debris by type and properly placing debris at the curb will greatly expedite debris removal.

Appendix 1 of this Tool Kit is New York's "Speed Up Your Cleanup" handout, which is designed as a model that local communities can use to develop a community specific guide to aid residents in separating the disaster debris at the curbside for collection.

Appendix 2 of this Tool Kit is the Department's "Garbage Collection Delay Fact Sheet", which contains guidelines for residents to follow when waste collections are delayed.

SECTION II. DIASTER DEBRIS PLANNING GUIDANCE

We recommend every municipality in New York have a Local Disaster Debris Management Plan (LDDMP), which can be part of their overall comprehensive Emergency Management Plan. Guidance on Preparing a LDDMP can be found in FEMA 325 Debris Management Guide, which is posted on the FEMA Debris Management web page at http://www.fema.gov/pdf/government/grant/pa/demagde.pdf

The Department recommends that LDDMPs, at a minimum, address the following areas:

- General Debris Handling and Waste Prioritization
- Pre-Approved Temporary Staging Areas for Vegetative and Non-Vegetative Waste Debris
- Debris Removal & Transportation
- Communications and Information Resources for Local Officials, Residents & Businesses
- Personnel Training

When preparing or revising a LDDMP, coordination with the county Office of Emergency Management (OEM), county household hazardous waste program, and county & local health departments is essential, and all parties should participate in the planning process.

A. General Debris Handling and Waste Prioritization

Depending on the severity the disasters, it may not be possible to address the pickup and disposal of all debris in a timely manner and maintain regular garbage pickups. Every LDDMP should, therefore, focus first on clearing the debris that hinders immediate lifesaving and emergency response actions. Once this debris is addressed, other debris can be removed, segregated, temporarily staged (if necessary), and then transported to a disposal or recycling facility. LDDMPs should consider the order in which debris will be collected and alert residents of any expected delays in garbage collection. See "Garbage Collection Delay Fact Sheet" in Appendix 2 of this Tool Kit for more information on handling collection delays.

Residents need to be advised that, unless otherwise instructed, all of New York's waste and recycling regulations remain in effect during a disaster, and that their waste materials must be separated by type to facilitate prompt removal. It is especially important to properly separate out and bag putrescible materials (for example, food wastes and other waste that cause odors and/or attract insects, rodents and other animals) so that they may be picked up on a priority basis. Additionally, household hazardous waste (i.e., chemicals, used oil, etc.) and e-scrap (i.e., TVs, computers, and monitors) should be separated from other waste debris so that they may be handled in an environmentally safe manner and properly disposed of or recycled. Separated debris should be placed along the right-of-way (the area between the sidewalk and the roadway) and should not be placed in the road, near downed wires, or in areas prone to flooding. In addition, debris placed for collection should not block mailboxes, electric and water meters, fire hydrants, or storm drains. Residents should also be made aware that during the debris removal process they may experience increased traffic and noise. See "Speed Up Your Cleanup" in Appendix 1 of this Tool Kit for more information on separating disaster debris for collection.

Waste separation at the TDMA is important to minimize odors, and rodent or other vector problems, and to protect workers who may come in contact with waste materials. Recyclable materials, such as metals and white goods (i.e., refrigerators, washers, dryers, etc.), and compostable materials such as tree branches, should be separated from those that must be disposed of as solid waste. This segregation helps facilitate the flow of these materials to recycling/composting facilities, and reduces the burden on, and costs of, solid waste disposal operations. In addition, household hazardous waste (HHW) and e-scrap should be stored separately in the TDMA to facilitate their proper handling and recycling/disposal. If these materials are not separated, it will likely require that all the material generated be disposed of as waste and usually at higher costs to the municipality.

Lessons Learned: Fall leaves which have been collected separately prior to a disaster need to be kept separate from other vegetative storm debris picked up by DOT contractors and delivered to appropriate facilities. Leaf compost is a much more valuable and therefore marketable commodity than the lower quality mulch made from mixed vegetative storm debris. Post-Sandy, the largest yard waste compost operator in the Hudson Valley region would not accept any vegetative storm debris because they make premium mulch and compost products. Had the leaves been kept separated from the vegetative storm debris, this facility could have easily taken thousands of yards of material out of the debris management stream for composting.

B. Siting Temporary Debris Management Areas (TDMAs)

Municipalities should identify, in advance of such disasters, appropriate TDMA locations that can be used to temporarily stage and/or process debris that cannot be directly transported to a disposal or recycling facility. For municipalities with no appropriate immediate areas to site a TDMA, it is essential to identify appropriate regional TDMAs that can be used and enter into an agreement with the appropriate parties for its use before an emergent situation arises. A shared service agreement may be utilized for setting up regional TDMAs with neighboring municipalities and would be recommended before such a disaster rather than after it has occurred.

TDMAs should only be located at sites which can be secured, and should not be located within a flood hazard or other environmentally sensitive area or a historic/archeological site. In siting TDMAs, municipalities should also consider the following:

- **Sizing the TDMA**: TDMAs should be large enough to accommodate debris from disasters of various magnitudes. A guide to estimating the required size of a TDMA is available in Appendix 3 of this Tool Kit.

- **Location of the TDMA**: Avoid choosing sites near sensitive areas, which may include: residences, schools, and hospitals. Local tolerance of impacts from noise, dust, and traffic significantly diminishes over time.

- **Cost of the TDMA location**: Use public land first to avoid costly leases. Use private land only if public sites are unavailable and approval is granted. Obtain a valid lease agreement to locate TDMAs on private property. The lease agreement should have provisions for returning the site to original conditions, documentation of the original conditions, and any insurance requirements of the property owner.

- **Access to the TDMA**: Look for sites with good ingress/egress to accommodate heavy equipment, heavy truck traffic and that have configurations that will allow for an efficient layout.

- **Attributes of the TDMA location**: Putrescible solid waste debris, white goods, HHW, and e-scrap must be stored on a paved area or in roll-off containers. The entire debris staging area does not have to be paved, but the areas for staging/storing these types of solid and hazardous waste debris must be paved. Vegetative debris, on the other hand, should be stored on a pervious (unpaved) surface to minimize stormwater runoff, unless otherwise approved by the Department. Masonry debris (concrete, brick, and block) and construction and demolition debris may be stored either on a pervious (unpaved) or an impervious (paved) surface provided that it is not otherwise contaminated. Consider siting a TDMA on a closed municipal landfill, if available. Please note operations on closed landfills may require additional approvals from the Department's Division of Materials Management.

Finally, municipalities should conduct a baseline environmental survey before debris operations begin so the TDMA can be returned to those conditions at the conclusion of the debris operations. The baseline environmental survey should document physical features and conditions existing at the site prior to use as a TDMA. Digital photos can be very helpful and are recommended. If the property is not owned by the municipality, the Department recommends performing environmental sampling of the soil and any on-site water prior to use to protect against future contamination complaints.

C. Obtaining Approval of Temporary Debris Management Areas (TDMAs)

Normally, waste management and facilities managing solid wastes are regulated under 6NYCRR Part 360 Solid Waste Management Facilities Regulations (Part 360). Applying Part 360 regulatory requirements to the management of disaster debris can present significant challenges. While certain emergency authorizations may be available after a Governor's emergency declarations and related declarations from the Commissioner, response to disasters in the absence of an emergency declaration must be performed under the requirements of Part 360.

Several pre-determined BUDs may be useful for some types of debris, including 360-1.15(b)(11) for recognizable, uncontaminated concrete and concrete products, asphalt pavement, brick, glass, soil and rock placed in commerce for service as a substitute for conventional aggregate, and 360-1.15(b)(3) for unadulterated wood, wood chips, and bark utilized as mulch, landscaping, animal bedding, erosion control, wood fuel production, or bulking agent at a 360-5 compost facility.

The following information will be useful to be included in the LDDMP and should be obtained prior to a disaster.

- Contact information, including emergency contact information, for the individual responsible for the TDMA.
- Documentation that the areas used to stage/store putrescible solid waste debris, white goods, household hazardous waste, and e-scrap are paved and areas used for staging vegetative debris are not paved. Masonry debris and construction and demolition debris can be stored in either paved or unpaved areas.
- Documentation that the TDMA is secured and not located within a flood hazard or other environmentally sensitive area.
- Documentation of endorsement by the county Office of Emergency Management.
- Documentation of endorsement from the local fire official. If a municipality does not have a local fire official then documentation should be obtained from the State Fire Marshal.
- Have available a site plan identifying the dimensions and locations of each proposed debris stockpile area within a TDMA, including the anticipated maximum height and volume of each stockpile. Vegetative stockpiles should be limited to approximately150' x 250' x 25', and adequate spacing for emergency equipment must be maintained between stockpiles.
- A description of the processing activities that will be conducted at this site.
    - Processing of vegetative debris (i.e., grinding and shredding) is permitted at TDMAs provided all processing equipment has a valid Air Pollution Control Permit. Contact your Regional Air Engineer for information on permits. This website has their contact information - http://www.dec.ny.gov/24.html Open burning of vegetative debris is prohibited in New York State, however, emergency authorization may be given in a disaster. Again, you can contact your Regional Air Engineer for more information.
    - Non-vegetative debris may not be ground for size reduction. Removal and separation of white goods, e-scrap, and HHW is recommended, along with removal and separation of other waste types, such as concrete, wood, metals. Removal of refrigerants from white goods is allowed at TDMAs, in accordance with applicable regulations. Visit EPA's website - http://www2.epa.gov/sites/production/files/documents/ConstrAndDemo_EquipDisposal.pdf
- A description of the stormwater control measures that will be implemented at the site, such as containerizing certain wastes, covering non-containerized wastes, and containment and perimeter controls (i.e. sediment fencing, hay bales, absorbent booms, etc.) for the entire site. Stormwater controls may be required at TDMAs. Contact your Regional Water Engineer for more information – http://dec.ny.gov/24.html Also, Appendix 5 of this Tool Kit contains information on controlling stormwater at TDMAs.
- A deed indicating ownership of the property. For properties not owned by the municipality, documentation of an agreement with the property owner for use of the property (i.e. a lease agreement) should be available.

Putrescible solid waste should not be stored at a pre-approved TDMAs longer than 7 days.

TDMAs for vegetative debris, white goods, masonry debris, construction and demolition debris, e-scrap, and household hazardous waste may be stored for longer periods, but in most cases should not exceed sixty (60) days unless unusual circumstances exist.

D. Debris Removal, Monitoring, and Transportation Contracts

A disaster that generates significant quantities of debris requires transportation equipment and/or debris removal and monitoring services to manage the debris. Municipalities should inventory the government vehicles that can be put into service to assist in debris removal and disposal. Additionally, municipalities should consider having stand-by contracts with emergency debris contractors for collection, removal and/or monitoring services to ensure that such services will be available. The stand-by contracts should be reviewed regularly and revised if necessary.

Lastly, it is important to know if the stand-by contractor for your municipality is also obligated to assist other municipalities. This will help determine if the contractor has the ability to respond to all calls for assistance during an emergency, especially for emergency disasters that are regional in nature.

E. Communications and Information Resources

LDDMPs should address how communication between all levels of government and emergency responders will be handled and where additional information can be obtained.

It is especially important to consider how information will be shared with residents during the initial stage of debris response. Such communication is necessary to alert residents of possible delays in garbage collection and the need to separating debris and properly place it in the correct location (curbside vs. right of way) for prompt collection.

To report any chemical or petroleum spills, review this website - http://www.dec.ny.gov/chemical/8428.html

F. Personnel Training

All personnel conducting debris operations should be trained, at a minimum, on items such as identification of hazards and proper use of personal protective equipment. Additional training specific to job duties should be conducted to ensure the health and safety of the staff working at the site. Personnel should also be trained in identifying the different solid waste types, such as HHW and e-scrap, to ensure all wastes are separated and managed properly.

G. Recordkeeping

Records of the amount of debris collected from the right of way, received at a TDMA, processed at the TDMA (for vegetative debris), and transported to a final destination facility must be maintained and the information provided to the Department on a regular basis while the TDMA is in operation.

The Department believes that the proper planning prior to disasters will help communities expedite the response and recovery. For additional information or guidance, or if there are questions regarding this information please contact the Division of Materials Management at (518) 402-8706 or by email at swpermit@dec,ny.gov

SPEED UP YOUR CLEANUP

Guide for New York Residents to expedite storm debris cleanup and recovery.

Storm Debris Cleanup Instructions

1. Put piles in the right of way (the area between the sidewalk and street).
2. Separate piles as shown below.
3. Don't pile materials near fire hydrants, mailboxes, utility poles, meters or storm drains.
4. Keep piles off the sidewalks and out of the streets.
5. Separate normal household trash for regular collections.
6. Share piles with neighbors.
7. For more information, contact your town or go to: www.dec.ny.gov

Recyclables

Recycle all the materials that are in your program.

Trash, Food Waste and Contaminated Paper

- Spoiled Food
- Wet/Moldy Paper and Cardboard

Vegetative Waste

- Trees
- Branches
- Stumps

Demotion Debris and Bulky Items

- Carpet
- Lumber
- Building Materials
- Furniture
- Drywall
- Barbecue Grills (without the tank)
- Lawn Care Tools
- Motors (drained of gas & oil

Appliances (White Goods)

- Refrigerators and Freezers (with all food removed and doors removed or secured)
- Washers/Dryers
- Air Conditioners
- Stoves

Electronics (e-Waste)

- TVs
- Computers
- Monitors

Household Hazardous Waste

- Oil Based Paints
- Lawn Chemicals
- Pesticides
- Batteries
- Propane Tanks
- Unbroken Fluorescent Lights

New York State Department of Environmental Conservation

Thanks to NJDEP for use of this poster.

APPENDIX 2 - GARBAGE COLLECTION DELAY FACT SHEET

Citizen cooperation in using alternatives to traditional garbage disposal will minimize problems resulting from a delay of waste collection services due to disasters.

The actions listed below were prepared by environmental and health personnel to assist you in minimizing the adverse effects of a disruption of waste collection at your homes and in your communities.

1	**Limit the amount of waste produced:**	- Avoid the use of disposable products such as paper or plastic plates, cups or disposable diapers. - Reuse products such as plastic containers, jars and aluminum foil. - Compost vegetative and yard wastes if space permits. - Delay any major household cleanups such as backyard cleanup, tree pruning or disposal of old furniture.
2	**Separate and store food wastes and other wet garbage:**	- Drain excess garbage moisture. Pour fats, drippings and grease into glass jars and seal with a screw-on lid. - Put food waste, disposable diapers and other wet waste into double plastic bags. - Add a capful of ammonia to waste to reduce odor which will attract animals and other vermin. - Secure trash bag tightly and store in a cool place.
3	**Separate and store recyclable materials:**	- Rinse bottles and plastic containers. - Rinse and crush aluminum and tin cans, trays and containers. - Bundle cardboard, paper, and magazines. - Store recyclable materials indoors, out of reach of children, and away from combustible materials.
4	**Separate dry, non-recyclable waste:**	- Store non-recyclable paper, containers, packaging and other dry waste indoors and away from combustible materials.
5	**Separate hazardous household waste:**	- Separate fluorescent lights, paints and thinners, insecticides and herbicides and store out of reach of children. - Hold until county household hazardous waste collection day.

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APPENDIX 3 - GUIDANCE FOR DETERMINING ACREAGE NEEDED FOR A TDMA

The quantity and type of debris that may be generated by disasters varies based upon the magnitude and type of the disasters, which can make planning for the management of that debris difficult. However, the Department provides the following guidance to assist municipalities when evaluating potential TDMA locations and sizes.

Note: This Guidance is based significantly upon the U.S. Army Corps of Engineers (USACE) "APPENDIX A, USACE HURRICANE DEBRIS ESTIMATING MODEL" available at: http://dps.sd.gov/emergency_services/emergency_management/images/dmgappa.pdf

Qualifiers: The estimated debris quantities calculated by the model have a predicted accuracy of ± 30%. The USACE formula was developed for use immediately prior to a hurricane disasters. For the purpose of pre-planning, the Department recommends assuming the mid-range for the hurricane category (e.g., 26 cubic yards) and medium to heavy for the storm precipitation multiplier (value of 1.3). The assumption of 3 persons per household is used in this guidance. While this guidance is based upon a hurricane as the debris generating disasters, the result can be used as a guide for other possible debris generating disasters, such as floods, building collapses, etc.

STEP 1—ESTIMATE QUANTITY OF DEBRIS

Calculate the amount of debris which may be generated by a disaster based on the number of households and businesses in the community as well as an estimate of vegetative cover. The resulting quantity of debris (Q) will be used in the calculation in Step 2.

Formula: Q= H(C)(V)(B)(S)

Q is the quantity of debris in cubic yards.
H is the population in the jurisdiction divided by 3 to determine the number of households. For example, a municipality with a population of 1200 would have an H of 400.
C is the storm category factor in cubic yards. The Department recommends using 26 cubic yards.
V is the vegetative cover multiplier. The Department recommends using the table below for determining vegetative cover. For our municipality example of 1200 people, V = 1.1.
B is the commercial/business/industrial density multiplier. The Department recommends using the table below for determining Business/Commercial density. For our municipality example of 1200 people we estimate a light business/commercial multiplier of 1.0.
S is the storm precipitation characteristic multiplier. The Department recommends using 1.3.

Vegetative Cover Multiplier	
Population Density	Vegetative Multiplier
Urban; > 3500 people per sq. mile	1.1
Suburban; < 3500 and > 2000 people per sq. mile	1.3
Rural; < 2000 people per sq. mile	1.5

Business/Commercial Density Multiplier	
Business/Commercial Use	Business/Commercial Multiplier
Heavy	1.3
Medium	1.2
Light	1.0

For our municipality example of 1200 people, Q = 14,872 cubic yards.

STEP 2—CALCULATE ACREAGE NEEDED FOR A TDMA

Using the debris generation quantity (Q) calculated in Step 1, determine the acreage required for storage at a TDMA. The maximum acreage required for the storage of all debris is determined by dividing the debris generation quantity (Q) by the number of cubic yards of debris which may be stored per acre and using a multiplier to account for the roadways within the site and the buffers around the site. The Department recommends using 16,117 cubic yards per acre and a roadways/buffers multiplier of 1.66 (see Calculation of Qualifiers below for more details).

Due to New York's substantial solid waste infrastructure and our recent experience with Superstorm Sandy, the Department recommends that local officials pre-plan TDMAs that are 10% of the maximum acreage required for the storage of all generated debris. This 10 percent infrastructure factor is based on the assumption that, in most cases waste stored at a TDMA can be moved out relatively quickly to final disposal destinations.

Formula:

TDMA Acreage=
Q divided by 16,117 cubic yard/acre x 1.66 for roads/buffers x 0.10 for Infrastructure Factor

For our municipality example of 1200 people, TDMA Acreage – 0.153

Calculation of Qualifiers:

Total volume per acre = 4,840 square yards/acre x 3.33 y = 16,117 cubic yards per acre

Debris pile stack height of 10 feet = 3.33 yards (y)

1 acre (ac) = 4,840 square yards (sy)

Roadways/buffers multiplier = 1.66

Infrastructure Factor = 10% or 0.10

Most common hurricane-generated debris will consist of the following:

- 30% Clean woody debris
- 70% Mixed C&D

IMPORTANT NOTES:

The Department urges local jurisdictions that do not have sufficient TDMA capacity due to lack of available space to consider the use of a shared service agreement. The Agreement must specify services to be provided, including scope of performance, assignment of responsibilities, and procedures for payments. The Department also urges consideration of regional TDMAs. Local officials should coordinate selection of TDMAs with their County Office of Emergency Management and County Solid Waste Planning office.

APPENDIX 4 - FREQUENTLY ASKED QUESTIONS ON THE APPROVAL AND OPERATION OF A TDMA

General Questions

1. What is a Temporary Debris Management Area or TDMA?

A TDMA is a site used to temporarily store debris which has been collected after a disaster, such as a flood, hurricane, Nor'easter, or terrorist attack. Use of a TDMA facilitates clearing of roads by providing an area where collected debris can be consolidated, sorted and processed prior to transportation to an appropriate solid waste management or recycling facility.

2. What debris may be stored at a TDMA?

Debris generated after a disaster that may be stored at a TDMA includes:

Bulky Solid Waste Debris – Large items of solid waste which because of their size or weight cannot be handled by the traditional municipal waste process. Bulky solid waste debris includes, but is not limited to, appliances, furniture (couches, chairs, tables, bookshelves, etc.), and other large household goods.

Construction & Demolition (C&D) Debris – Waste building material and rubble resulting from an emergency debris generating disasters. The following materials may be found in construction and demolition debris: treated and untreated wood scrap; concrete, asphalt, bricks, blocks and other masonry; plaster and wallboard; roofing materials; ferrous and non-ferrous metal; non-asbestos building insulation; plastic scrap; dirt; glass (window and door); and other miscellaneous materials.

Disaster Debris – Generic term for a mixture of waste generated from a disaster.

E-scrap – A desktop or personal computer, computer monitor, portable computer, or television sold to a consumer.

Household Hazardous Waste (HHW) – Household items that contain hazardous chemicals such as automobile fluids (used waste oil, antifreeze, etc.), batteries, oil-based paints and stains, cleansers, swimming pool chemicals, lawn-care chemicals, unidentified liquids, household cleaners, and pesticides. Latex paint is not household hazardous waste.

Putrescible Solid Waste – Household garbage, such as kitchen waste, that is subject to odors and may attract insects, rodents, or other vermin.

Spill Debris - Proper management of spill residuals and debris entails ensuring that recovered product, contaminated water, contaminated soil, and other contaminated materials (e.g., sorbents) are handled, stored, transported, treated, and/or disposed of in accordance with all state, local, and federal requirements. The first step is determining if the spill residual is hazardous or nonhazardous solid waste. This website provides additional information - www.dec.ny.gov/docs/remediation_hudson_pdf/2x3.pdf

Vegetative Debris – Source separated whole trees, tree trunks, tree parts, tree stumps, brush, and leaves. Note: Fall leaves should be kept separate from the other vegetative debris and ideally sent directly to facilities for composting rather than interim staging sites.

Siting a TDMA

1. How do I determine how large of a TDMA I need?

It is difficult to determine the size and capacity of a TDMA prior to a disaster, since it is primarily dependent on the scope of the disaster. However, the Department has developed guidance to assist municipalities in making an estimate for pre-planning purposes. The guidance is in Appendix 3 of this Tool Kit.

2. What if there are no suitable sites in my municipality for a TDMA?

Municipalities are encouraged to work with counties to set up regional TDMAs for the use of multiple municipalities. In addition, municipalities can set up regional TDMAs through shared service agreements with neighboring municipalities. Regional TDMAs can reduce costs associated with debris management. Municipalities that set up a regional TDMA through a shared service agreement do not have to be adjacent to one another.

Operating a TDMA

1. What methods of processing are allowed at a TDMA?

Vegetative debris may be ground or shredded for size reduction at TDMAs provided all processing equipment has a valid Air Pollution Control Permit. Vegetative debris may not be burned, except in a permitted solid waste resource recovery facility or as otherwise approved by the Department.

Invasive species are a concern. Requirements for handling debris can be found on this website. http://www.dec.ny.gov/regulations/8751.html

Non-vegetative debris may not be ground for size reduction. Removal and separation of white goods, e-scrap, and HHW is recommended. Removal and separation of other waste types must be approved by the Department on a case-by-case basis.

2. Can we contract with a private contractor to run our TDMA?

A private contractor may be engaged to operate a TDMA, rather than the government entity using its own employees. The contractor can be limited to processing vegetative debris or may run the entire TDMA, including collection, storage, and disposal. Contractors must operate the TDMA in compliance with any Department approvals, rules and guidelines, as well as contract requirements.

3. What are valid end-markets for debris stored in a TDMA?

Waste Type	End-Market
C&D and Bulky Waste	- NY permitted solid waste facility (landfill or transfer station/material recovery facility) - Out of state solid waste facility that is operating under an approval issued by that state's regulating entity.
Household Hazardous Waste	- County-run household hazardous waste collection, - Permitted hazardous waste facility - Out of state facility operating under an approval issued by that state's regulating entity.
White Goods	-Scrap metal processing facility as defined in Part 360
Unprocessed Brush and Tree Parts	- Wood processing facility (6NYCRR 360-16.1)

	- Out of state recycling center operating under an approval issued by that state's regulating entity.
Wood Chips	- End uses where the chips are used as a product such as placement on park trails or as mulch.

4. Are markers and/or signage required at a TDMA?

Yes, maximum stockpile dimensions should be clearly marked to ensure operators are aware of the maximum amount of debris that may be stockpiled at the location. In addition, while not required, directional signage is recommended to ensure truck drivers are aware of where to go on-site. This is especially important when utilizing outside contractors for debris removal rather than municipal or county personnel.

Reporting

1. What do I do when the TDMA operations are completed?

A TDMA is considered "closed" when all material has been removed and the site has been returned to its original condition.

Plans

1. Does the site plan have to be prepared by a professional engineer (PE)?

The required site plan does not have to be prepared by a professional engineer. The site plan could be a site plan that was prepared by a PE but has been marked up to show where the TDMA and the stockpiles will be located or can simply be a print-out of an enlarged tax map clearly showing the site with the required information marked on the map.

2. What needs to be on the site plan?

The site plan must show the unprocessed and processed stockpile locations, dimensions of the stockpiles (length, width, and height in feet), stormwater controls that will be implemented, site access and egress, traffic flow within the site, and security measures that will be implemented at the site (gate, fencing, etc.). In addition, photographs showing the existing conditions of the site must be provided.

APPENDIX 5 - STORMWATER MANAGEMENT CONTROLS REQUIRED AT A TDMA

Here is general information on proper management to prevent the discharge of stormwater runoff. For more information on Stormwater Management - http://www.dec.ny.gov/chemical/8468.html .

Perimeter Control

Temporary debris management areas should have perimeter controls surrounding the site to prevent discharge of contaminated stormwater runoff. In addition, buffers should be provided between debris stockpiles and all property lines. Examples of perimeter controls are:

- Stormwater controls such as hay bales*, silt fences*, construction ditches*, or sotm drain inlet protection* to prevent the discharge of contaminated runoff into nearby water bodies or storm inlets.
- Preventative siltation/spill measures for storm drain inlets, such as oil booms or filter fabric inlet protection*.
- Debris containment controls such as curbs, berms, or jersey barriers.
- Windblown debris controls, such as slatted fencing, tarping or other forms of cover.
- Preventative tracking measures such as stabilized construction access* or rumble strips at exits.

*For more information and detail see the New York State Standards and Specifications for Erosion and Sediment Control, November 2016 or most current version. (http://www.dec.ny.gov/chemical/29066.html)

Debris Containment

The debris categories below also require a cover or a berm. Covers include tarps and fabric frame structure. Berms include sand bags, hay bales and curbing.

Items to be placed in Dumpsters or other Storage Containers - cover and berm required

- Oil Tanks
- Infectious/Medical Waste
- Putrescible solid waste debris
- E-scrap
- Hazardous Household Products (Paints, Cleaning Supplies, Solvents, etc.)
- Hazardous Materials (any waste that is toxic, corrosive, reactive or ignitable)

Items to be placed on Impervious Surfaces (parking lot, streets and concrete pads) – berm required

- Vehicles (including boats and RVs)
- Disaster Debris Mixed
- White Goods (Appliances)

Items to be placed on Pervious Surfaces (grass, sand and dirt) – berms required

- Vegetative Waste
- Bulky Waste
- Construction and Demolition Debris

APPENDIX 6 – Disaster Debris Management under Part 360 Requirements

Applying Part 360 regulatory requirements to the management of natural disaster and/or storm debris can present significant challenges. While emergency authorizations may be available after a Governor's emergency declarations and related declarations from the Commissioner, response to disasters in the absence of an emergency declaration must be performed under the requirements of Part 360. The following is a compilation of scenarios and mechanisms which can be employed quickly to manage disaster debris under standard Part 360 requirements. In all cases, officials should be mindful of the potential for some components of disaster debris to be reused or recycled instead of being disposed of. Several pre-determined BUDs may be useful for disaster debris, including 360-1.15(b)(11) for recognizable, uncontaminated concrete and concrete products, asphalt pavement, brick, glass, soil and rock placed in commerce for service as a substitute for conventional aggregate, and 360-1.15(b)(3) for unadulterated wood, wood chips, and bark utilized as mulch, landscaping, animal bedding, erosion control, wood fuel production, or bulking agent at a 360-5 compost facility.

Scenario: Temporary staging areas located in the immediate vicinity of a targeted clean up area are exempt from regulation under Part 360.

Description:

The placement of disaster debris in temporary staging areas for the sole purpose of making it accessible to additional manpower and/or equipment that will load the waste into transport containers or vehicles is considered part of the initial waste collection process, and therefore is excluded from the definition of "solid waste management facility" (360-1.2(b)(158)). Immediate vicinity means the closest location possible from a targeted clean up area that allows for consolidation and loading of debris for the purpose of subsequent transport.

Example:

Disaster debris is removed from a stream culvert and brought to the nearest roadside for temporary staging until it can be removed by a waste transporter. Minimal processing (sorting) of materials may take place at these locations. For example, large bulky contaminants may be separated from wood wastes and placed into separate containers. However, processing must be kept to a minimum, as these staging areas are likely to be located along roadway right of ways.

Scenario: Temporary storage, transfer, and processing areas which are located on property owned by the same owner as the specifically targeted clean up area(s) are exempt from regulation under Part 360.

Description:

Temporary storage, transfer, and processing facilities located at a single or multiple family residence, school, park, industry, hospital, commercial establishment, correctional facility, or farm and used exclusively for the waste generated at that location or at a location under the same ownership are exempt from Part 360 under 360-1.7(b)(4). A minor complication with the use of this exemption is that it contains a limitation on the types of properties that qualify. In the disasters another property type (e.g. a vacant property zoned residential) is used for management of on-site generated waste, staff should recognize this activity as being performed in the spirit of the exemption. In cases where it is difficult to identify property lines in relation to where waste removal is taking place, staff should use the best information available and professional judgment to determine exemption applicability.

The Department has the ability to impose time limitations for activities covered by this exemption. Limitations should be stated in writing to both the property owner and the authority in charge of clean-up activity at the targeted location.

Example:

Storm debris is removed from within and along a stream corridor and brought to a location under the same ownership where it can be separated, stored, and removed at a later date within the limitations imposed by the Department (if any).

Scenario: Disaster debris is taken to a transfer station registered under 360-11.1(b) with prior Department approval.

Description:

Storm debris may be accepted at a registered transfer station provided written approval has been received from the Department. Part 360-11.1(b)(1)(i) allows the Department to approve receipt of waste other than household waste at a registered transfer station on a permanent or temporary basis. While disaster debris will include some household waste, the waste stream itself cannot be considered as such due to the commingling of other non-household wastes. The waste stream from such disasters does not perfectly fit into any Part 360 waste category, therefore it is recommended that such approvals include the wording "storm and/or flood related debris." This will allow for the facilities to accept, without confusion, the various mixtures of wastes generated from disasters. Processing of wastes at registered facilities should be limited to very basic separation and sorting, although the Department may exercise discretion based on individual site conditions. This scenario could fit either a facility with an existing registration or one which is issued a new registration specifically for storm debris cleanup.

Example:

A rural registered transfer station accepts disaster debris after receiving written Department approval. The approval is for a three month period, and allows for waste to be placed in an area separate from normal operations. Processing of waste is limited to removal of tanks or other bulk metal and large uncontaminated vegetative matter such as logs, stumps and large branches. All other waste must be sent out for subsequent transfer, processing or disposal at permitted facilities.

Scenario: Processing of land clearing debris is exempt from Part 360 regulation under 360-16.1(b).

Description:

Mixed disaster debris processing is a regulated activity. However, trees, stumps, and brush can be accepted for processing at facilities exempt from regulation. Soil and rock components of disaster debris may be reused without prior Department approval.

Example:

Wood components of disaster debris are separated from other wastes at a temporary staging area or transfer station and sent to a land clearing debris processing facility located centrally in the storm impact area. Wood is chipped at the facility, and subsequently utilized as erosion control material in storm damaged areas of the county.

Scenario: A landfill for the disposal of clean wood can be exempt from Part 360 permit requirements under 360-7.1(b)(1)(ii).

Description:

Under 360-7.1(b)(1)(ii), a landfill for the disposal of trees, stumps, yard waste and wood chips generated from these materials is exempt from Part 360 permit requirements when origin and disposal of the waste occur on properties under the same ownership or control. The landfill must operate only between the hours of sunrise and sunset. Under 360-1.2(b)(185), *yard waste* means leaves, grass clippings, garden debris, tree branches, limbs and other similar materials, such as aquatic weeds.

Example:

An office complex disposes of disaster debris consisting of trees and stumps from trees downed by the disaster within the green space of their complex.

Scenario: Land clearing debris is taken to a landfill registered under 360-7.2.

Description:

Landfills three acres or less in area used for the disposal of only land clearing debris are eligible for registration under 360-1.8(h) provided the landfill is operated in compliance with ECL 27-0707.2-a (i.e., its operation is consistent with the state solid waste hierarchy) and all applicable requirements of 360-1.8(h). According to 360-1.2(b)(94), *land clearing debris* means vegetative matter, soil and rock resulting from activities such as land clearing and grubbing, utility line maintenance or seasonal or storm-related cleanup such as trees, stumps, brush and leaves and including wood chips generated from these materials. Land clearing debris does not include yard waste which has been placed by residents for curbside collection. The land clearing debris landfill must also comply with the siting restriction and operating requirements of 360-7.2.

Example:

Disaster debris meeting the definition of land clearing debris is removed and disposed of in either a preexisting registered land clearing debris landfill or in one registered specifically in response to the disasters. (Note: Authorizing post-storm landfills will occur when petitioners have exhausted recycling options for vegetative storm debris.) Land clearing debris does not include yard waste which has been placed by residents for curbside collection. If a disaster event happens during fall leaf collection season, every effort should be made to ensure that leaves are not co-mingled with storm debris but rather sent to an authorized yard waste facility for composting to reduce the volume of vegetative storm debris requiring emergency management.