FOR ADDITIONAL INFORMATION, PLEASE SEE THE NDA'S WEBSITE AT THE FOLLOWING URL:
http://www.agr.state.ne.us/division/bpi/pes/fmp.htm

Fumigation Management Plan
A Template/ Checklist Approach

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Instructions: Use the template items as a guide in creating your Fumigation Management Plan.

Keep one Fumigation Management Plan on file for each type of fumigation done at your facility, e.g. spot fumigation of empty bins; fumigation of grain while loading; railcar fumigations, etc.

For one-time fumigations or those done only occasionally (not pre-planned or scheduled), create a separate Fumigation Management Plan for each.

Update the plan or create a new plan for each calendar year.

For each type of fumigation carried out at your facility, create both a plan and a checklist. Keep both on file for a minimum of 2 years, or longer if your state requires records of pesticide applications be kept longer.

Fumigation Management Plan

Company Name and Address: _____

Description of Facility: _____

Type of Fumigation _____

Describe the site (building, railyard, etc.) where fumigation is to take place.

Address: _____

_____

Describe the site (building, railyard, etc.) where fumigation is to take place. _____

_____

_____

List areas recently constructed or remodeled: _____

_____

_____

Facility Owner/Manager		**Certified Applicator (Fumigator) in charge:**	
Name:		**Name:**	
Daytime phone:		**Certification No.**	
Night phone:		**Daytime phone:**	
Mobile phone:		**Night phone:**	
Pager number:		**Mobile phone:**	
		Pager Number	

Emergency Information

Hospital Emergency (ER duty nurse):
(for first-aid information in case of exposure) _____

Fire
(or 911) _____

Police
(or 911) _____

Other: _____

Poison
Control:

What type of fumigation do you plan to conduct? Check ALL that apply.
(For multiple types of fumigations, it will be necessary to create multiple Fumigation Management Plans.)

- ❑ **Space (Specify below)**
  - ❑ **Food processing plant**
  - ❑ **Feed Mill**
  - ❑ **Mill**
  - ❑ **Warehouse**
- ❑ **Vertical Storage**
- ❑ **Flat Storage**
- ❑ **Tarpaulin**
- ❑ **Spot (Includes grain handling equipment, empty tanks, empty silos, silos within a building)**
- ❑ **Chamber**
- ❑ **Vehicle (Specify below)**
  - ❑ **Railcar**
  - ❑ **Trailer**
  - ❑ **Ocean Container**
- ❑ **Vessel (Specify below)**
  - ❑ **Ship**
  - ❑ **Barge**

For Railcars Only: (Attach written documentation for notification to receiver of in-transit railcar(s) under fumigation).

Date of notification: _____

Contact person notified: _____

Receiver trained to properly receive, open, aerate, and test fumigated railcars? ❑ **YES** ❑ **NO**

If the site consists of a building, what is the building constructed of? Check all that apply.

- ❑ **Steel**
- ❑ **Brick**
- ❑ **Concrete**
- ❑ **Masonry block**
- ❑ **Wood**

If the site is a building, is it free-standing, or is it attached to or adjacent to another structure or structures? Check one.

- ❑ Free-standing
- ❑ Connected to another building that may be occupied during fumigation period
- ❑ Fumigation area is an area within a larger building or complex of buildings; part of the building or complex of buildings may be occupied during fumigation period
- ❑ Fumigation area consists of silos, tanks or other vertical storage with enclosed galleries/tunnels at top and bottom; these spaces may be occupied during fumigation period

If the site is attached to or adjacent to a building not scheduled for fumigation or adjacent to a portion of a building not scheduled for fumigation, describe how you will ensure that persons are not exposed to levels of the proposed fumigant above the STEL for that fumigant. (Check <u>all</u> that apply; supply further details under "Other")

- ❑ Connections will be sealed off using polyethylene sheeting, tape, etc.
- ❑ Gas readings will be taken at the start of each work shift in occupied adjacent and/or connected areas
- ❑ Gas readings will be taken in adjacent and/or connected areas at intervals of _____ hours while adjacent areas are occupied.
- ❑ A plan is in place for opening windows, adding fans, etc. if gas levels approach STEL at any time (describe plan):

_____

_____

_____

- ❑ Continuous electronic monitoring of gas levels will be conducted by means of (specify device):
- ❑ Supplying workers with gas-detecting badges (phosphine)
- ❑ Other: _____

_____

_____

_____

_____

_____

Make a drawing of the site, showing (at the least) locations of doors and other potential entryways; location of water sources; location of adjacent areas not scheduled for fumigation; and nearby buildings and/or occupied areas. Attach the drawing to this Plan.

Describe the commodity you intend to fumigate:

Commodity:

❑ Raw Agricultural (describe): _____

❑ Processed Food (describe) _____

❑ Feed (describe): _____

❑ Non-Food/Feed (describe): _____

Condition of commodity: (indicate if infested, moldy, or out of condition) _____

_____

Volume occupied by commodity: _____ cu. ft. *or* _____ bu.

Mode of storage: _____

_____

Previous treatment history of commodity/site: _____

_____

Exposure time considerations:

Fumigant to be used: _____

Commodity temperature (temperature of enclosure of spot or empty-bin fumigation):

_____ F (*or*: _____° C)

Minimum fumigant exposure at measured temperature: hours

Fumigation will take place from _____ on
(*Time*)

_____, _____ through
(*Day*) (*Date*)

_____ on _____, _____
(*Time*) (*Day*) (*Date*)

Down time required (include time needed for sealing; fumigation exposure period; aeration and testing):

_____ on _____, _____
(*Time*) (*Day*) (*Date*)

through

_____ on _____, _____
(*Time*) (*Day*) (*Date*)

Commodity moisture: _____%

Deactivation method planned: _____

_____

_____

_____

_____

Dosage Considerations:

Note: Refer to product label/Applicator Manual for allowed ranges of dosage.

Cubic footage to be fumigated: _____ cu. ft.

(*Or*: bushels: _____ bu.)

Labeled rate: _____/ 1,000 cu. ft.

(*Or*: _____/1,000 bu.)

Amount of product required: _____

- ❑ pellets *or*
- ❑ flasks of 1,660 pellets each *or*
- ❑ tablet prepacs *or*
- ❑ Magtoxin prepacs
- ❑ Fumi-Cels or
- ❑ Fumi-Strips .
- ❑ Lbs. of Eco2Fume®

Describe site-specific sealing requirements (with respect to personnel and materials required to seal all doors, windows, openings to the outside, and especially to effectively seal areas to be fumigated off from adjacent or attached areas not scheduled to be fumigated)

Plan for safety/security during fumigation period:

The following safety/security measures will be taken (Check all that apply):

- ❑ Placarding of doors, hatches, ladders
- ❑ Safety “boots” or “clamshells” on doors to which unauthorized personnel may have keys
- ❑ Fumigation conducted in secure yard, fenced and locked against unauthorized entry
- ❑ Watchman/guard on duty
- ❑ Other (describe)

Plan for fumigant level monitoring during fumigation period:

❑ Fumigant levels will be monitored at intervals of _____ hours using _____. (*Specify device*)

❑ Fumigant levels will not be monitored. Characterization from past experience has shown this is not necessary.

Plan for opening/aeration of fumigated site:

❑ Aeration is scheduled to begin at: _____ A.M./P.M. on _____, _____.
(*Time*) (*Day*) (*Date*)

Describe the measures that will be taken to ensure employees, bystanders and other persons are not exposed to the fumigant during aeration:

❑ This is a railcar fumigation. Arrangements have been made, in writing, for the receiver of the fumigated railcar(s) to perform required aeration and monitoring.

Plan for <u>deactivation</u> of spent fumigant:

❑ Dry (check this item only if an approved dry-deactivation setup is in place, e.g. a vented, covered barrel of adequate size and in a secure location, away from occupied areas) (*See Applicator Manual for instructions*.)

❑ Wet (*See Applicator Manual for instructions*.)

Plan for <u>disposal</u> of deactivated spent fumigant: (*See Applicator Manual for instructions*.)

Plans for additional cleanup and preparation of site and/or commodity for release:

Fumigation Management Plan Checklist

Prepared for:

Company Name, Address: _____

_____

Description of Facility: _____

Type of Fumigation _____

This FMP form is provided to address factors that must be in place prior to performing all fumigations. It emphasizes safety steps to protect people and property. This form is general in nature and cannot be expected to apply to all types of fumigation situations. Each item must be considered. However, it is understood that each fumigation is different and not all items will be necessary for each fumigation site.

Planning and Preparation

- ❑ Read and review with facility management and appropriate employees any existing FMP, MSDS, product label, Applicators Manual and other relevant safety procedures. Read and review with facility management the Notice of Fumigation Emergency Management Plan (Appendix 1).

- ❑ Obtain or develop a drawing of the facility layout. This drawing is to be used as part of the FMP to verify measurements and to make site-specific notes. Note the location of:

· drains
· connections to adjacent areas and other buildings not scheduled for fumigation
· doors, windows, vents, pipe through-passes and other openings that will require sealing
· doors and entryways that will need to be secured against entry
· areas where new construction or remodeling have occurred since the last fumigation
· fans and the switches or breakers that control them

Attach this drawing to the Fumigation Management Plan and update it yearly, or prior to each fumigation. Keep it on file with the FMP.

- ❑ Inspect the site (or vehicle, vessel, etc.) to determine its suitability for fumigation. Consult previous records for any changes to the structure.

- ❑ Review the facility's air handling equipment that will be shut down during the treatment and utilized during aeration. Mark switches on the facility drawing, and flag or mark switches for easy identification during the aeration process.

- ❑ Take appropriate measures to assure that persons in adjacent or connected areas are not exposed to the fumigant. Such measures include carefully sealing any and all connections between buildings or areas within a building; placarding doors between fumigated and non-fumigated areas; and the taking of gas readings in adjacent or attached areas, at periodic intervals, while fumigation and aeration are taking place. Document measures taken on the Fumigation Management Plan.

- ❑ Identify equipment or locations within the area to be fumigated that must be sealed off or isolated. Sophisticated electronic equipment (panel boards, computers) must be isolated from phosphine gas to prevent potential corrosion damage.

- ❑ Consult with facility management in the development of procedures and appropriate safety measures for nearby workers, bystanders and nearby residents who will be in and around the area during application and aeration.

Personnel

- ❑ Schedule personnel for the fumigation. Product labeling requires at least one state certified/licensed pesticide applicator to be present and on site to oversee all phases of the fumigation procedure.

  Only licensed personnel certified in Fumigation category may apply fumigants. These personnel must also be trained in the use of personal protection devices, including detection equipment. When a self-contained breathing apparatus is required, a minimum of two units must be present.

Personnel must be medically approved, fit tested and trained in use of respiratory equipment prior to using. All training should be documented and on file.

- ❑ Notify all plant personnel, outside contractors, security personnel and other interested parties of the treatment well in advance and in writing. Use the Notification of Fumigation and Emergency Response Plan, Appendix 1. Instructions should include that personnel are not to enter any areas while fumigation signs/placards are posted.

- ❑ Instruct all personnel on the following (see Appendix 1):

  - to report any accident and/or incidents related to fumigant exposure, provide a telephone number for emergency response reporting
  - to report to proper authorities any theft of fumigant and/or equipment related to fumigation
  - the established meeting area for all personnel in case of an emergency

- ❑ Determine sign-in and sign-out procedures so all facility employees and any other contractors or visitors are accounted for prior to beginning the treatment (see Appendix 2).

Monitoring

Safety Monitoring

- ❑ Check safety equipment required for the job. Ensure that the detection equipment necessary for monitoring gas levels and clearing fumigated areas is available and calibrated, if necessary. If detection equipment utilizing detector tubes are to be used, ensure that detector tubes have not expired.

- ❑ Conduct phosphine gas monitoring in areas to prevent excessive exposure and to determine where exposure may occur. Document where monitoring occurred and what the gas concentrations were (see Appendix 3).

- ❑ Document all gas exposure readings for each fumigation site (see Appendix 3). This includes safety monitoring done around the exterior perimeter of areas under fumigation as well as efficacy monitoring for gas concentration during the fumigation. Retain monitoring records with the FMP for two (2) years or longer if required by the state lead agency governing pesticide use. (*Minnesota requires records be kept for 5 years.*)

- ❑ Check for possible leaks near the treatment site, where the guard is located, and any other critical areas around or near the fumigation site such as areas downwind from the site.

When monitoring log records document there is no phosphine present above the safe levels, subsequent monitoring is not routinely required. However, spot checks must be made occasionally, especially if conditions significantly change.

Monitoring must be conducted during aeration and corrective action taken if gas levels exceed the allowed levels in an area where bystanders and/or nearby residents may be exposed.

Efficacy Monitoring

- ❑ Take gas readings from within the fumigated structure to ensure proper gas concentrations.

Notification

- ❑ Ensure that all entrances can be secured and guarded.

- ❑ Submit the "Official Notification of Fumigation" (see Appendix 4) to the Fire Chief 24 hours prior to the fumigation, unless otherwise notified by the fire department. Record the signature of the Fire Chief/Authorized Personnel on this form.

- ❑ Notify local authorities of the fumigation and ensure that safety information packets are delivered and accessible to appropriate personnel (i.e. on-call physicians, fire chief, police). Phone numbers, pager numbers and the location of the certified applicator in charge during the fumigation must appear on the hospital packets. It is recommended that this same information be left with facility management. Notification should occur prior to the fumigation (some local authorities require up to a week in advance) so that questions posed by local authorities can be addressed.

- ❑ Prepare written procedures (see Appendix 1), which contain explicit instructions, names, and telephone numbers of local authority of notify if phosphine levels are exceeded in an area that could be dangerous to bystanders.

- ❑ For railcar fumigations, document that the receiver of in-transit vehicles under fumigation has been notified.

Sealing Procedures

- ❑ If the site has been fumigated before, review the previous FMP for sealing information.
- ❑ Make sure that construction/remodeling has not changed the area to be treated.
- ❑ Prepare the structure for the fumigation and complete the required sealing.
- ❑ Place warning placards on every possible entrance to the fumigation site. For railcars, place placards on both ladders and the top hatch.

Application Procedures/Fumigation Period

- ❑ Apply fumigant in accordance with label requirements. Apply fumigant in the least hazardous manner, i.e. outside application where appropriate.
- ❑ Review the gas release route that will be followed with the fumigation team. For release conducted inside the treated area, a minimum of two properly trained fumigators should be present for the release of any fumigant and they should be in sight of each other during the release.
- ❑ Ensure that all entrances to the area being treated have been locked (or otherwise secured) and confirm placement of warning placards
- ❑ Make sure guard service is on site and instructed on emergency response information and procedures.
- ❑ Complete a final walk through of the area to be treated.
- ❑ Thoroughly check areas to be fumigated to ensure that all personnel other than the fumigation team have left the area and are so indicated on the sign-out sheet.
- ❑ Place the fumigant only after all personnel other than the fumigation team have evacuated the premises. Only licensed personnel certified in Fumigation may participate in the placement and distribution of the fumigant.

  Solid phosphine formulations should be placed by a sufficient number of properly trained people so that the fumigant is distributed in a short amount of time and before reaching levels above established safe limits (PELs & TLVs), unless respiratory protective equipment is worn. The fumigant should be placed so that the fumigators can walk away from the treated area as they open each subsequent container.

  Fumigators should always remain in sight of each other from the time they begin opening and distributing solid phosphine formulations until the time they leave the building together. The buddy system should also be followed during aeration procedures when gas concentrations exceed established safe limits.

- ❑ Follow OSHA rules for confined space entry when entering grain bins, flat houses or other confined spaces.

  While the fumigant is being released, it is advisable to have additional people, with respiratory protection equipment ready, waiting outside to assist if necessary.

- ❑ Provide watchmen/guards when entry into the fumigated site by unauthorized persons cannot otherwise be assured.
- ❑ Perform air monitoring for phosphine when distributing solid phosphine fumigant without respiratory protection. Applicators must have proper respiratory equipment available and ready to use if levels of phosphine in the work area exceed established safe limits (PELs and TLVs).
- ❑ Do not use manlifts when wearing SCBAs. Once gas is released, elevators must not be used due to the potential for mechanical failure.
- ❑ After exiting the fumigated area from the gas release, immediately lock and seal the last exit.

Post-Application Operations

- ❑ Provide watchmen when the fumigation site cannot be secured from entry by unauthorized persons during the aeration process.

- ❑ Use a suitable gas detector before re-entry to determine fumigant concentration.

- ❑ When the exposure period is complete, begin aeration in the least hazardous manner based on weather conditions such as temperature, wind direction and the building construction (multi-level, ease of roof access, etc.).

- ❑ After the spent solid fumigant is removed, turn on the plant air handling equipment to assist aeration. Use additional fans if necessary to assist in aeration of the facility.

- ❑ Wear respiratory protection if gas levels exceed established safe limits (PELs and TLVs) in the breathing range.

- ❑ During the aeration process, take gas readings around the external perimeter of the fumigated area, where the guard is located, and any areas where exposure is possible. Ensure that required monitoring during the aeration process is performed and documented on Appendix 3. Record final cleared readings on state pesticide usage records.

- ❑ Readings taken in the fumigated area must indicate gas levels below established safe limits (PELs and TLVs) of the fumigant utilized before entering without respiratory protection.

- ❑ Check confined spaces and product. Check areas most likely to retain gas such as enclosed rooms, basement areas, shrink or stretch wrapped bags, powdered milk and other finely ground material.

- ❑ Account for and properly dispose of all fumigant before releasing the plant. Count all spent phosphine products to ensure that all fumigant used on the job has been retrieved. After dry or wet deactivation of spent phosphine products, they may be disposed of at approved local landfills. Do not use plastic bags or other non-ventilated containers to collect or move phosphine products; closed containers may result in a fire hazard. Phosphine gas may ignite spontaneously at levels above its lower flammable limit of 1.8% v/v, it is important not to exceed this concentration.

- ❑ Do not transport spent phosphine products until they are deactivated to below 0.3ppm. Fumigated vehicles must be completely aerated before moving vehicles onto public roads.

- ❑ Do not release an area under fumigation until the presence of the fumigant utilized is no longer detected or has been cleared **well below** established PELs/TLVs. It is essential that bins within a fumigated area be cleared (even if they were not fumigated) prior to release of the facility to the customer. If there is a possibility of off gassing, arrangements must be made to ensure the area or bins are cleared. Record results obtained during clearing.

- ❑ If bins are fumigated with phosphine during a methyl bromide fumigation, test bins for the presence of both phosphine and methyl bromide.

- ❑ When transferring a commodity that is not yet aerated below established PELs/TLVs, warning signs must be affixed to the new holding container or area and employees working in the area should be notified and gas testing documented.

- ❑ Remove warning placards when aeration is complete.

- ❑ Notify facility management that personnel, contractors or others may be allowed to re-enter the aerated area.

Appendix 1:
Notification of Fumigation and Emergency Response Plan

The following areas of the facility will be fumigated with phosphine on (**DATE**), at approximately (**TIME** & **DAY** OF THE WEEK).

AREAS TO BE TREATED

No personnel may be in the treated area during the fumigation. Re-entry will be allowed only after aeration and monitoring indicates gas concentrations are well below the allowable safe exposure limit. Personnel are not to re-enter until warning signs/placards are removed from the entrances.

In case of an emergency situation, contact the fire department or medical emergency by dialing 911. Then contact:

(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**

In the event the area is evacuated, personnel should report to the area listed below so that everyone can be accounted for:

The nearest phone away from the treatment site is located at:

In the event of an emergency which requires evacuation of nearby residents, local authorities should contact the following residents or businesses:

(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**
(CONTACT NAME)	**(PHONE)**

Appendix 2:
Personnel Checklist

Current FMP guidelines require confirmation in writing that all personnel in and around the area to be fumigated have been notified prior to the application of the fumigant. This checklist may be used to verify notification. Route or post Attachment 2 “Notification of Treatment and Emergency Response Plan” along with the following “Checklist for Personnel” and have personnel date after reading. The sign-in, sign-out portion may be used the day of treatment to account for personnel.

Name	**Date Notified**	**This portion for use the day of treatment**	
		Sign-In	**Sign-Out**
Personnel routinely in treatment area:			
Facility personnel & contractors:			

Appendix 3:
PHOSPHINE FUMIGATION GAS MONITORING REPORT

(insert company name here)

Customer: _____ Date: _____

Efficacy Gas Concentration Monitoring

Location:	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Comments/Conditions
	Readings									

Safety/Air Quality Monitoring

Location:	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Date: ____ Time: ____ Initial: ____	Comments/Conditions
	Readings									

Appendix 4:
OFFICIAL NOTICE OF FUMIGATION

(Company name here) at (insert address here):

has planned a fumigation at the following location:

Pesticide Being Used:	
Date of Application:	
Date of Aeration:	
Permit Required?	❑ Yes ❑ No

Certified Applicator In Charge Date Fire Chief/Authorized Official Signature Date

Telephone: _____

Mobile: _____

Pager: _____

Notice to the Fire Chief or Authorized Official

**Please return this notification via facsimile to (insert company name here) at:

_____
_____

Appendix 5: Site Drawing