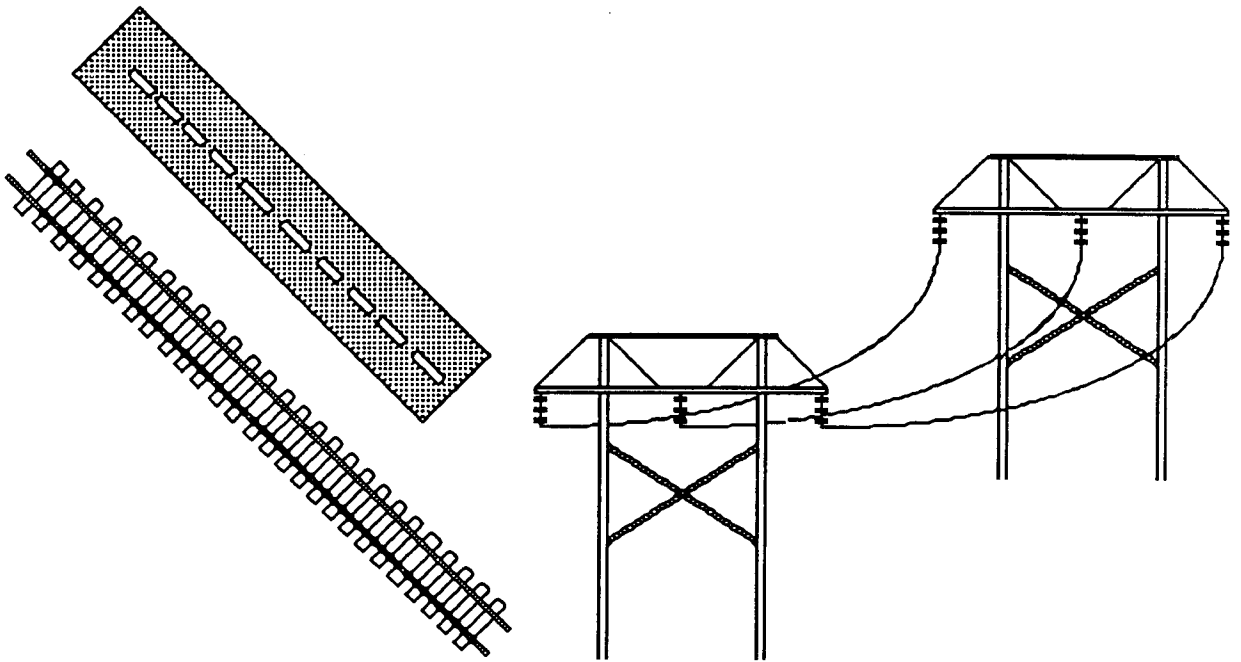


RIGHTS-OF-WAY HERBICIDES

A CITIZENS' GUIDE TO THE STATE REGULATIONS ON VEGETATION MANAGEMENT ON UTILITY, RAILROAD AND ROADSIDE RIGHTS-OF-WAY



MASSACHUSETTS AUDUBON SOCIETY



MASSACHUSETTS ASSOCIATION OF
CONSERVATION COMMISSIONS

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**A CITIZENS' GUIDE TO THE STATE
REGULATIONS ON VEGETATION
MANAGEMENT ON UTILITY, RAILROAD,
AND ROADSIDE RIGHTS-OF-WAY**

November 1988

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MASSACHUSETTS AUDUBON SOCIETY

**MASSACHUSETTS ASSOCIATION OF
CONSERVATION COMMISSIONS**

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TABLE OF CONTENTS

INTRODUCTION	1
A BRIEF HISTORY	1
THE NEW STATE PROGRAM	2
Overview of the Pesticide Board Regulations	2
Vegetation Management Plan	3
Yearly Operational Plan	4
Protection of Sensitive Areas	6
Changes to the Wetlands Protection Act Regulations	8
State List of Recommended Herbicides	11
EVALUATING VEGETATION MANAGEMENT PLANS	11
EVALUATING YEARLY OPERATIONAL PLANS	18
OTHER ISSUES	19
Appeals	19
Municipal Notification	19
Touch-Up Applications	19
Sunset Provisions	19
Wetlands Bylaws and Other Local Controls	19
HERBICIDES	20
Problems and Concerns	20
State List of Recommended Herbicides	21
Herbicide Summaries	22
CONCLUSION	25
RESOURCES	26
BIBLIOGRAPHY	28

INTRODUCTION

Herbicide spraying on rights-of-way (ROWs) has been a source of conflict between municipalities and rights-of-way operators for several years. Electric utilities, railroad companies and public agencies use herbicides to control vegetation that may disrupt their facilities. On the other hand, local officials and citizens are concerned about the potential effects herbicides may have on public health, groundwater, and wetlands. In an attempt to resolve this conflict, a new program has been established by the state Pesticide Board to protect public health and the environment while centralizing regulatory oversight at the state level.

This Guide is intended to explain the new rights-of-way regulatory program. It is written primarily for local officials, especially conservation commissioners and board of health members, and concerned citizens.

A BRIEF HISTORY

Herbicides gained popularity among utility companies soon after World War II when 2,4-D and 2,4,5-T, the first synthetic herbicides, were introduced. Before the 1940s, utility companies employed seasonal work crews to cut vegetation with axes and saws. By the mid-1950s herbicides became the primary means of vegetation control. Aerial spraying on rights-of-way in Massachusetts was last performed in 1971.

Railroads followed a similar pattern. Prior to World War II, vegetation on railroad ballast areas was controlled with waste oil, salt, controlled burns, and arsenical compounds. Herbicides became

predominant during the 1950s. Brush control alongside railroad beds was controlled manually until the early 1970s, when herbicides became the primary method.

Public concerns probably grew out of the general debate over pesticide safety that started with Rachel Carson's *Silent Spring*, and the controversy over the Viet Nam defoliant Agent Orange. During the late 1970s, a few towns enacted regulations to control rights-of-way (ROW) herbicide spraying. In 1981, Representative William Mullins of Ludlow successfully pushed through legislation requiring companies to notify municipalities 21 days before applying herbicides (referred to as the Mullins Amendment). This legislation, which was codified as Section 6B of the Pesticide Control Act (G.L. c.132B), greatly expanded local awareness of ROW herbicides. Following the receipt of the first notices in the Spring of 1982, dozens of towns responded with bylaws, board of health regulations, and enforcement of the Wetlands Protection Act.

On Cape Cod, most of the towns enacted bylaws or regulations. In response, Commonwealth Electric Company suspended its use of herbicides and to date has not resumed applications. The town of Wendell passed the most celebrated herbicide bylaw in 1981; but Massachusetts' Attorney General, who must approve all bylaws, disapproved the measure. Wendell appealed the decision and the Supreme Judicial Court (SJC) finally invalidated the bylaw and a subsequent health regulation in 1985 (see Wendell v. Attorney General, 394 Mass. 518; also refer to Massachusetts Audubon Society, Groundwater Information Flyer No.7: Pesticides and Groundwater Protection). The SJC ruled against Wendell because the town imposed standards on pesticide use beyond those

established by the state and thereby frustrated the state's sole authority to determine the reasonableness of a specific pesticide's use in particular circumstances. On the other hand, the SJC found that the state pesticide law does not explicitly forbid all local pesticide regulation. Several municipalities have valid pesticide bylaws and regulations including a new version enacted by Wendell.

Another result of the Mullins Amendment was that conservation commissions required railroad companies to file Notices of Intent for herbicide applications under the Wetlands Protection Act (G.L., c.131, s.40). Some commissions determined that herbicide applications might alter wetlands and therefore would require Orders of Conditions. The railroads did not submit Notices of Intent and instead appealed Positive Determinations of Applicability to the Department of Environmental Quality Engineering (DEQE). An adjudicatory decision upheld the commissions in 1986.

Railroad and utility companies contended they could not maintain their rights-of-way and comply with the regulations of each municipality. They argued that it would be impractical to file applications in 351 municipalities, attend hearings, and comply with community-specific rules.

The Executive Office of Environmental Affairs intervened in an attempt to resolve the conflict. In October 1982, a generic environmental impact report (GEIR) was initiated to study the potential impacts and the need for new regulatory programs.

The Advisory Task Force, appointed to oversee the GEIR, recommended the establishment of a new state regulatory program, the development of vegetation management plans based on the use of

integrated pest management techniques, protection of sensitive areas from herbicide impacts, streamlining of the regulatory process, establishment of public participation procedures, and risk assessments of all ROW herbicides.

Based upon the Advisory Task Force's recommendations, the Department of Food and Agriculture's Pesticide Bureau developed regulations, which were approved by the Pesticide Board and became effective on July 10, 1987. Concurrently, DEQE amended the Wetlands Protection Act regulations to limit conservation commission involvement to certification of wetland boundary delineations when rights-of-way operators comply with the Pesticide Board regulations.

The Pesticide Board regulations take effect in three phases. Railroads are subject to the regulations on January 1, 1988 and utilities and roadside managers are subject in 1989 and 1990 respectively. The railroads were unable to meet the 1988 deadline although some spraying was conducted under one-time-only emergency regulations. Consequently, the first plans, submitted during the fall of 1988, will be valid for the 1989 season.

THE NEW STATE PROGRAM

OVERVIEW OF THE PESTICIDE BOARD REGULATIONS

The stated purpose of the Pesticide Board rights-of-way regulations (333 CMR 11.00) is:

... to promote the implementation of Integrated Pest Management techniques and to establish those standards, requirements and procedures necessary to minimize the

TABLE 1**GENERAL REQUIREMENTS FOR ALL ROW HERBICIDE APPLICATIONS**

1. Only persons certified or licensed by the Pesticide Bureau may apply herbicides on ROWs.
2. All herbicide use on ROWs must be in accordance with approved Vegetation Management Plans and Yearly Operational Plans.
3. Herbicide concentrate shall not be handled, mixed or loaded within 100 feet of a sensitive area.
4. Sensitive area boundaries must be marked in the field unless they are readily identifiable.
5. Foliar herbicide applications shall not be made to vegetation greater than 12 feet in height except for side trimming.
6. Herbicide applications are prohibited when wind may cause drift.
7. Aerial applications are prohibited.

Source: 333 CMR 11.03

risk of unreasonable adverse effects on human health and the environment associated with the use of herbicides to maintain rights-of-way and to establish a statewide and uniform regulatory process.

If the program is successful, herbicide use will be minimized through Integrated Pest Management (IPM) techniques, sensitive areas will be protected, and ROW operators will follow uniform standards.

In 1989, railroads and utilities cannot legally apply herbicides to control ROW vegetation unless they have obtained approval of a five-year Vegetation Management Plan (VMP) and a Yearly Operational Plan (YOP) from the state Pesticide Bureau. Beginning in 1990, roadside management agencies will be similarly regulated.

**TO RECEIVE THE
ENVIRONMENTAL MONITOR
WRITE TO:**

MEPA Unit
Executive Office of Environmental Affairs
100 Cambridge Street, 20th Floor
Boston, MA 02202

The required contents of the VMP and YOP are detailed in the Pesticide Board regulations at 333 CMR 11.00 et seq. In addition to the required plans, ROW operators must comply with general requirements when applying herbicides in the field (see Table 1).

**VEGETATION
MANAGEMENT PLAN (VMP)**

The VMP is intended to be a general document that describes the right-of-way system, the need for vegetation control, the

TABLE 2**REQUIRED CONTENTS OF VEGETATION MANAGEMENT PLANS (VMP)**

1. Statement of objectives.
2. Description of target vegetation.
3. Methods of vegetation control.
4. Justification of herbicide use.
5. Methods of identifying and protecting sensitive areas.
6. Operational guidelines for field personnel.
7. Description of an IPM-based vegetation control program.
8. Description of alternative land use or vegetation management options.
9. Remedial action plan to address spills and accidents.

Source: 333 CMR 11.05(2)

TABLE 3**VMP ADVISORY PANEL MEMBERSHIP**

Commissioners or designees of the
Departments of:

- Food & Agriculture/Pesticide Bureau
(non-voting)
- Environmental Quality Engineering
- Public Health
- Public Works

and representatives of the following
organizations appointed by the Commissioner of
Food & Agriculture:

- Massachusetts Association of Conservation
Commissions
- Massachusetts Association of Health Boards
- University of Massachusetts/Cooperative
Extension Service
- Railroad companies
- Utility companies
- Herbicide applicators
- Environmentalists

Source: 333 CMR 11.05(4)

rationale for selecting particular control methods including herbicides, the overall vegetation management control strategy based on an IPM approach, and the field procedures that will protect sensitive areas and minimize herbicide use. The required contents are summarized in Table 2.

Before the Pesticide Bureau may approve a VMP, the plan must be subject to review by the public and a VMP Advisory Panel composed of agency designees and appointments made by the Commissioner of Food and Agriculture. Upon submittal of the draft VMP to the Pesticide Bureau, a public notice is published in the *Environmental Monitor* which is published bi-weekly by the Executive Office of Environmental Affairs. The Bureau may also make additional requirements for public notice. Public hearings will be held by the Bureau in appropriate regions of the Commonwealth. Local officials, citizens, and other interested persons may also

submit written comments. The public hearing process closes 45 days from the submittal of the VMP unless the deadline is extended by the Bureau for good cause.

Following public review, the VMP and all comments are reviewed by the eleven member VMP Advisory Panel (see Table 3). Within 30 days the panel submits a recommendation to the Pesticide Bureau to approve, deny, or modify the VMP. Thirty days after receiving the recommendation, the Bureau issues a decision. Upon approval, the VMP is valid for five years.

YEARLY OPERATIONAL PLAN (YOP)

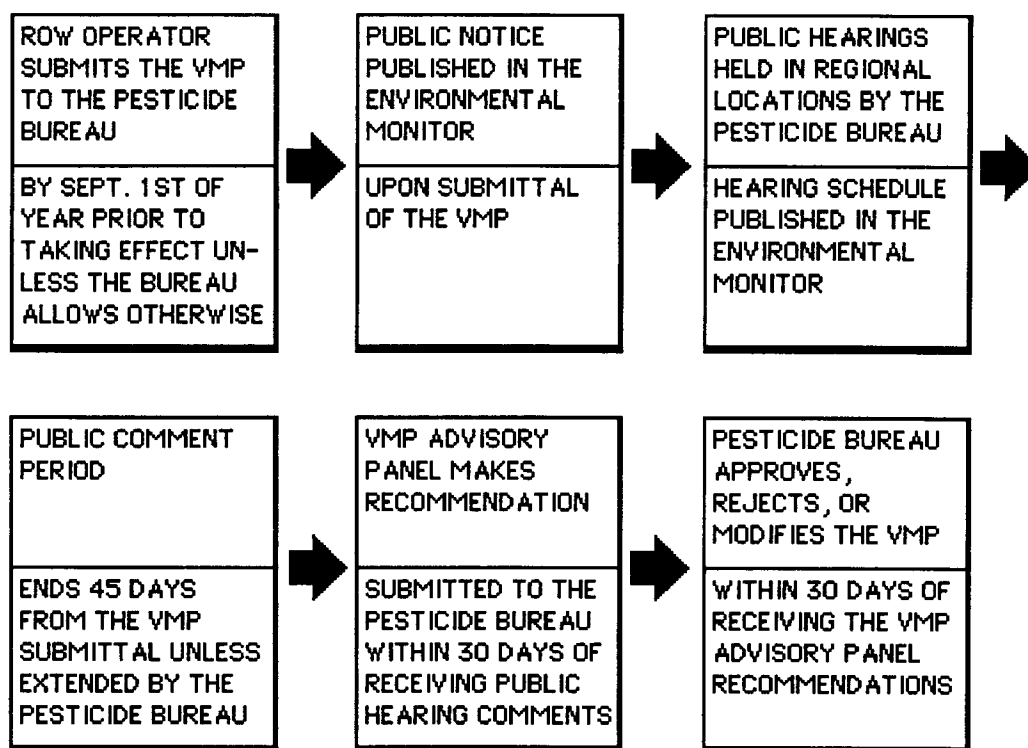
In addition to the VMP, a Yearly Operational Plan, or YOP, must also be prepared by the ROW operator for approval by the Pesticide Bureau. Whereas the VMP is submitted once every five years,

TABLE 4**REQUIRED CONTENTS OF YEARLY
OPERATIONAL PLANS (YOP)**

1. Maps locating ROWs and sensitive areas.
2. Names of herbicide active ingredients, carriers, and adjuvants.
3. Herbicide application techniques.
4. Alternative control methods.
5. Name of application contractor.
6. List of target vegetation.
7. YOP supervisor.
8. Sensitive area flagging methods.
9. Herbicide fact sheets.
10. Procedures and locations for handling, mixing, and loading herbicide concentrate.

Source: 333 CMR 11.06(2)

FIGURE 1

VMP PROCESS

the YOP must be prepared for every year during which herbicide applications are proposed. The YOP should provide specific operating details based on the general vegetation control strategy outlined in the VMP. The required contents for YOPs are summarized in Table 4.

The ROW operator must submit the YOP at least 90 days before the proposed start of herbicide spraying. Upon submittal, a public notice must be published in the *Environmental Monitor*. A public review process may be established by the Pesticide Bureau. Within 90 days of

FIGURE 2

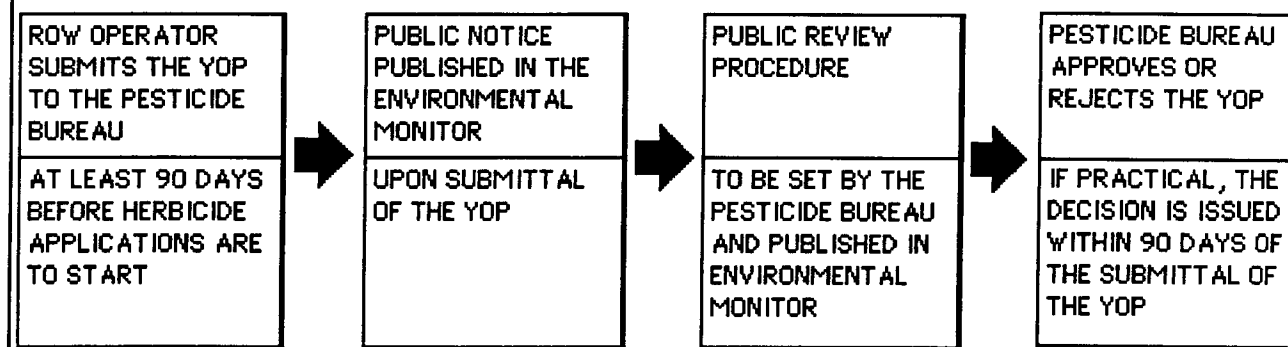
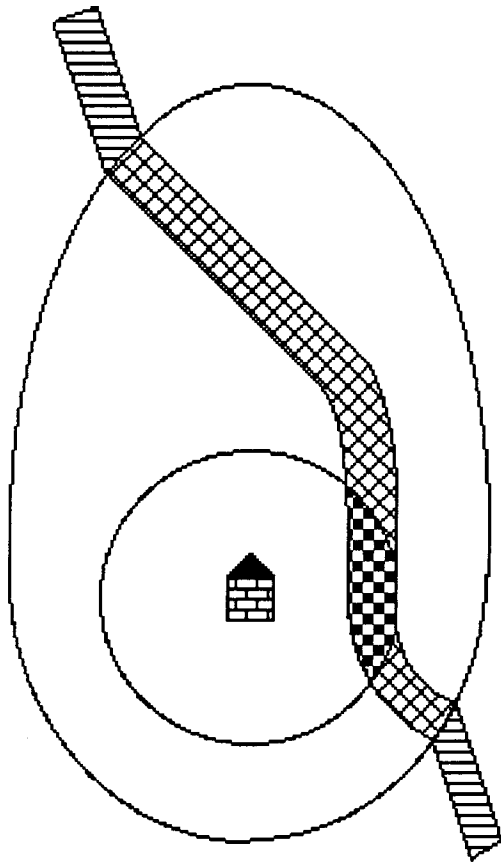
YOP PROCESS

FIGURE 3

PUBLIC GROUNDWATER SUPPLIES

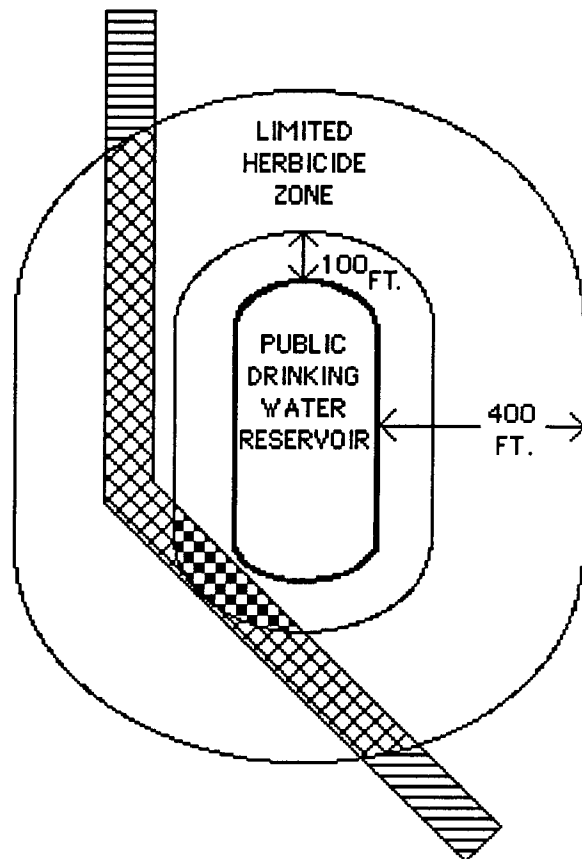


KEY

-  ROW IN NO HERBICIDE ZONE WITHIN 400 FEET OF PUBLIC WELL
-  ROW IN LIMITED HERBICIDE ZONE WITHIN ZONE II PRIMARY RECHARGE AREA; WITHIN 0.5 MILE OF PUBLIC WELL IF ZONE II IS NOT DELINEATED
-  ROW OUTSIDE SENSITIVE AREA

FIGURE 4

PUBLIC SURFACE WATER SUPPLIES



KEY

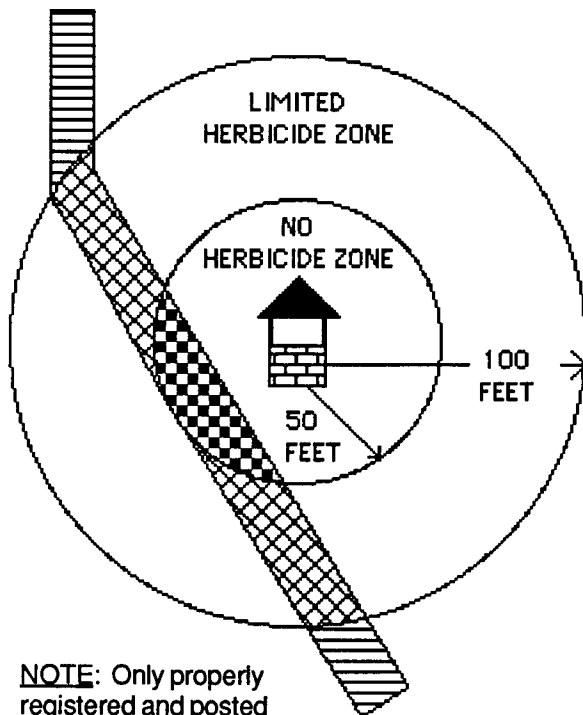
-  ROW WITHIN NO HERBICIDE ZONE 100 FEET FROM PUBLIC SURFACE WATER SUPPLY
-  ROW WITHIN LIMITED HERBICIDE ZONE BETWEEN 100 & 400 FEET FROM PUBLIC SURFACE WATER SUPPLY
-  ROW OUTSIDE SENSITIVE AREA

receiving the YOP the Bureau must decide on its acceptability.

PROTECTION OF SENSITIVE AREAS

The Pesticide Board regulations, in addition to requiring advanced planning to minimize herbicide use, require ROW

operators to protect certain sensitive areas by complying with specific performance standards. These sensitive areas are **public water supply wells, private drinking water supplies, public surface water supplies, wetlands, surface water, inhabited areas, and agricultural areas.** Figures 3 through 7 illustrate the sensitive areas and their zones of protection.

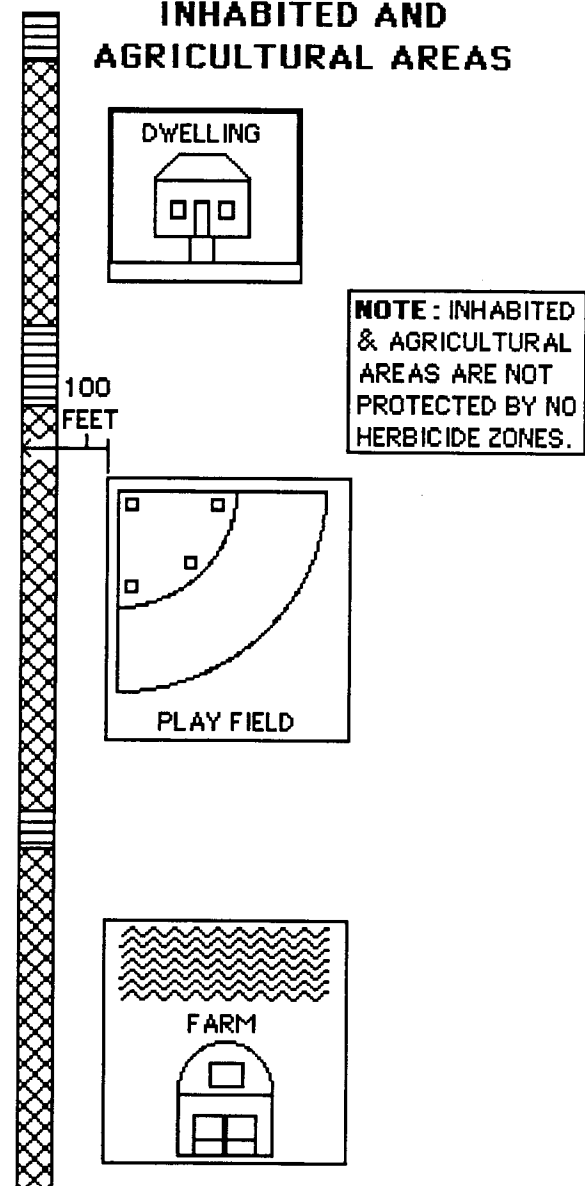
FIGURE 5**PRIVATE DRINKING
WATER SUPPLY**

NOTE: Only properly registered and posted wells qualify for protection.

KEY

-  ROW WITHIN NO HERBICIDE ZONE
50 FEET FROM PRIVATE WELL
-  ROW WITHIN LIMITED
HERBICIDE ZONE
BETWEEN 50 AND 100 FEET
FROM PRIVATE WELL
-  ROW OUTSIDE SENSITIVE AREA

Sensitive areas are to be protected by required setbacks, limits on application frequency, restrictions on application methods, and monitoring requirements. There has been disagreement about the adequacy of some of the protection measures, such as setback distances. During the VMP and YOP review processes, local officials and citizens can propose additional restrictions or

FIGURE 6**INHABITED AND
AGRICULTURAL AREAS****KEY**

-  ROW WITHIN LIMITED
HERBICIDE ZONE
100 FEET FROM INHABITED AND
AGRICULTURAL AREAS INCLUDING
DWELLINGS, SCHOOLS, HOSPITALS,
PARKS, AND OTHER AREAS IN WHICH
PEOPLE LIVE, WORK OR GATHER.
-  ROW OUTSIDE SENSITIVE AREAS

conditions on herbicide use in sensitive areas.

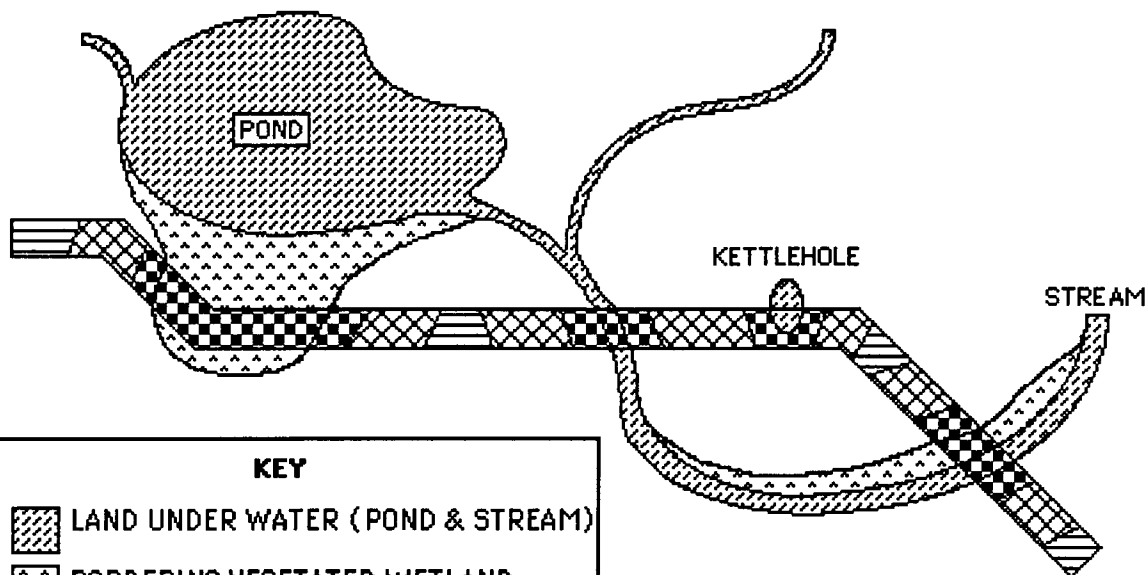
Through the public reviews of VMPs and YOPs, local officials and citizens can nominate specific areas for protection, which fall within one of the sensitive area categories. One of the greatest concerns with the new state program is that some sensitive areas for which there are no state records will be overlooked by ROW operators during the planning process. Although sensitive areas such as public wells are documented by DEQE, others such as wetlands and private wells will not be adequately identified without local assistance. Written comments should be submitted by local officials and citizens to the Pesticide Bureau during the VMP and YOP review processes noting the type and

location of sensitive areas in their communities. Identification of these areas will also prove useful to municipalities in other efforts such as in wetlands protection and reviews of subdivisions and site plans.

CHANGES TO THE WETLANDS PROTECTION ACT REGULATIONS

Conservation commissions can no longer regulate herbicide use on rights-of-way under the Wetlands Protection Act (G.L., c.131, s.40) if the ROW operator is in compliance with the Pesticide Board regulations. ROW operators who comply with the Pesticide Board regulations by submitting VMPs and YOPs are not

FIGURE 7
WETLANDS AND STANDING WATER



KEY

-  LAND UNDER WATER (POND & STREAM)
-  BORDERING VEGETATED WETLAND
-  ROW OUTSIDE SENSITIVE AREAS
-  ROW WITHIN NO HERBICIDE ZONE
10 FEET FROM WETLAND, LAND UNDER WATER, OR STANDING WATER
-  ROW WITHIN LIMITED HERBICIDE ZONE
10 TO 100 FEET FROM WETLAND, LAND UNDER WATER, OR STANDING WATER

NOTE: HERBICIDES MAY BE APPLIED WITHIN BORDERING VEGETATED WETLANDS BY UTILITIES IF THEY HAVE SHOWN IN A STUDY ACCEPTED BY THE PESTICIDE BUREAU AND DEQE THAT OTHER METHODS ARE MORE DESTRUCTIVE AND IF STANDING WATER IS NOT PRESENT. RAILROADS AND ROADSIDE MANAGEMENT AGENCIES MAY NOT APPLY HERBICIDES IN WETLANDS UNDER ANY CIRCUMSTANCES.

TABLE 5

PROTECTION OF SENSITIVE AREAS

SENSITIVE AREA	NO HERBICIDE ZONE	LIMITED HERBICIDE ZONE	LIMITS	COMMENTS
Public Groundwater Supplies	Zone I equals 400 foot radius around a public water supply wellhead	Zone II equals the primary recharge area excluding the Zone I. The Zone II covers the area delineated by a hydrogeologic study or, in the absence of a study, a 0.5 mile radius around a public water supply wellhead	Herbicides must be applied selectively by stem application or low pressure foliar techniques A minimum of 24 months must elapse between applications except for touch-up work	
Public Surface Water Supplies	100 feet from the edge of water	Between 100 and 400 feet from the edge of water	Same as for Public Groundwater Supplies	
Private Drinking Water Supplies	50-foot radius around a private well	Between 50- and 100-foot radius around a private well	Same as for Public Groundwater Supplies	To be protected, private wells must be marked in the field according to the regulations and reported to the Board of Health; see Figure 8
Surface Waters/Standing Water	10 feet from the edge of standing or flowing water	Between 10 and 100 feet from the edge of standing or flowing water	A minimum of 12 months must elapse between applications Spraying only by selective low pressure foliar or stem applications	Kettleholes and Isolated Land Subject to Flooding that contain standing water at the time of herbicide use are protected.

TABLE 5
CONTINUED

SENSITIVE AREA	NO HERBICIDE ZONE	LIMITED HERBICIDE ZONE	LIMITS	COMMENTS
Wetlands	10 feet from the edge of wetlands	Between 10 and 100 feet from the edge of wetlands	Same as for Surface Waters/Standing Water	Public utilities may apply herbicides on or within 10 feet of wetlands, but not in standing or flowing water, if the Pesticide Bureau finds herbicides cause less impact than mechanical methods based on a utility-sponsored study Floodplains are not protected unless they contain standing water at the time of herbicide use
Inhabited Areas (referred to as Habitated Areas in the regulations)	Not designated	100 feet from dwellings, parks, schools, hospitals, recreational areas where people generally live, work, or gather	Same as for Surface Waters/Standing Water	The edge of Inhabited Area has not been clearly defined by the regulations. Common sense suggests using the property boundary or edge of clearings as found in yards, parks, etc.
Agricultural Areas	Not designated	During the growing season, 100 feet from cultivated vegetation including gardens, fields, orchards, greenhouses, and pastures	Same as for Surface Waters/Standing Water	

required to file Notices of Intent and do not need to obtain Orders of Conditions. The only requirement is that the ROW operator must delineate wetland boundaries and seek verification from conservation commissions by filing Requests for Determination of Applicability (see 310 CMR 10.05(3)(a)). The commission does not determine if the work is a potential alteration of wetlands. The wetlands regulations presume that herbicide applications will not alter resource areas if the boundaries are properly delineated and the ROW operator complies with the Pesticide Board regulations. The Request for Determination is supposed to be filed prior to submitting the VMP to the Pesticide Bureau. In regard to the validity of local laws and regulations, see the discussion on page 19.

STATE LIST OF RECOMMENDED HERBICIDES

ROW operators will select herbicides from among those registered by the Pesticide Board Subcommittee under the Mass. Pesticide Control Act (G.L. c.132B). To more effectively protect sensitive areas, the Pesticide Bureau and the DEQE will issue a list of herbicides recommended for use in limited herbicide zones of sensitive areas. The list will be based on technical reviews of each herbicide's environmental fate and toxicity conducted according to a memorandum of understanding developed by the two state agencies. A discussion of herbicides that could appear on the list is included in this Guide.

The recommended herbicide list will include a set of guidelines for the application of each herbicide in sensitive areas. During the public comment process, local officials and citizens may propose that additional conditions be imposed.

EVALUATING VEGETATION MANAGEMENT PLANS (VMP)

The successful protection of sensitive areas and minimization of herbicide use is dependent on the participation of local officials and citizens in the public review process. Public commentators will have intimate knowledge of sensitive area locations in their communities. More importantly, public scrutiny of the plans filed by ROW operators is needed to ensure that all alternatives to herbicides have been seriously considered and that the smallest volume of herbicide will be used.

The following discussion is intended to guide public reviewers in their evaluation of the 5-year Vegetation Management Plans. A checklist (see Table 6) follows which summarizes the elements that would be included in a thorough VMP. All are not required by the regulations. This guidance is not meant to be comprehensive and can be expanded upon as plans are reviewed by local officials and citizens.

Statement of Objectives. This section should provide an overview of the ROW operator's vegetation control goals and needs. The statement should describe the ROW system and include a list of affected municipalities, a map, types of structures and facilities located on the ROW, descriptive dimensions, and explanation of how vegetation interferes with the ROW. Most importantly, long range goals should be established.

Target Vegetation. The VMP should list the general types of plants that will be subject to management efforts and identify the species which are most commonly controlled. Such a list is important because herbicide labels often state which species are effectively treated. VMPs

should not be expected to list every conceivable species that may be encountered on a right-of-way.

A list of desirable plant species should also be provided. Except on railroad ballasts, the goal should be to establish a stable shrub community which will discourage tree growth and minimize maintenance requirements. Therefore, ROW operators should indicate which species they plan to leave alone and encourage.

Control Methods. This section should describe all the available methods of vegetation management including physical, mechanical, chemical, and cultural techniques. The methods will vary with the type of right-of-way. The ROW operator is not obligated to use any particular method, but the VMP should explain why alternatives to herbicides are not utilized.

The description of each method should include details about the type of situation in which it is appropriately used, types of equipment, time of year in which it is effective, economic factors, and any other details essential to understanding its use.

Justification of Herbicide Use. This part of the VMP may be the most controversial. The VMP should present a well-documented rationale justifying the selection of herbicides over non-chemical controls. The rationale should include discussions of environmental, safety, and economic factors as well as effectiveness. Reviewers should critically examine the arguments to see if they are well-founded analyses or unsupported assertions.

Sensitive Areas. The VMP does not have to identify specific sensitive areas in each municipality. It must present a plan for the protection of each type of area. The

plan should describe how sensitive areas will be identified, how they will be mapped and flagged in the field, and how vegetation will be managed in the sensitive area.

Public wells can be easily identified using DEQE Division of Water Supply records and maps. The protected areas around each well include the Zone I (400-foot radius) and the Zone II (primary recharge zone). The Zone II boundaries will be those determined by hydrogeologic studies for the purposes of aquifer protection plans or, in the absence of a hydrogeologic delineation, will be assumed to be a 0.5 mile radius around a public well. Local officials should indicate in their comments on VMPs whether their town or city has delineated the Zone IIs.

Public surface water supplies can be identified through DEQE records. The sensitive area is a 400-foot buffer zone around reservoirs. If the surface water supply is a river, it is not clear how the boundaries are to be delineated. Streams that feed public reservoirs are protected as wetlands and surface water.

Private wells will be among the most difficult sensitive areas to protect because public records are not readily available. The Pesticide Bureau has developed a program to inventory private wells located within 100 feet of rights-of-way. Mailings have been sent to all boards of health to request their assistance with the inventory. Each board is asked to notify private well users of the new procedures to qualify for regulatory protection. Boards are also asked to mark the locations of private wells on base maps provided by the Bureau. These maps will be made available to ROW operators for incorporation into the Yearly Operational Plans. Towns which are unfamiliar with this program should contact the Pesticide Bureau (see the resource list at the end of the Guide).

TABLE 6

VMP CHECKLIST

OBJECTIVES AND NEEDS

- ☐ Description of the right-of-way (ROW) system
 - ☐ List of municipalities in which the ROW is located
 - ☐ Map of the ROW system
 - ☐ Length of the right-of-way
 - ☐ Types of facilities and structures around which vegetation will be managed
- ☐ Description of objectives
 - ☐ Overview of how vegetation interferes with the ROW
 - ☐ Summary of government regulations requiring vegetation management
 - ☐ Long term vegetation management goals

IDENTIFICATION OF VEGETATION

- ☐ List of target vegetation by general types and names of the most common species encountered on the ROW
- ☐ List of desirable plant species that will be encouraged

METHODS OF CONTROL

- ☐ Description of mechanical, physical, cultural, and chemical methods that are potentially available
 - ☐ For each method, description of the equipment used, time of year the method is employed, & operational details

JUSTIFICATION OF HERBICIDE USE

- ☐ Rationale for choosing herbicides over other methods
 - ☐ Economic factors
 - ☐ Environmental factors
 - ☐ Safety factors
 - ☐ Effectiveness of control

SENSITIVE AREA PROTECTION

- ☐ Procedures for identifying sensitive areas
- ☐ References and sources of information
- ☐ Methods of flagging and marking boundaries in the field
- ☐ Overview of performance standards

OPERATIONAL GUIDELINES

- ☐ Weather restrictions
- ☐ Equipment calibration parameters
- ☐ Procedures for accessing ROWs across private property
- ☐ Maintenance of visual buffers
- ☐ Disposal of slash
- ☐ Repairing site damage
- ☐ Procedures for mixing and loading herbicides
- ☐ Recordkeeping procedures
- ☐ Qualifications of applicators
- ☐ Worker safety requirements
- ☐ Vegetation management specifications

CONTINUED

IPM PROGRAM

- ☐ Description of vegetation management goals
 - ☐ Target plant species and the rationale for removing them
 - ☐ Desirable species that will be encouraged
- ☐ Action levels at which vegetation control will be performed
- ☐ Selection of control methods
- ☐ Selection of least-toxic herbicides
- ☐ Timing of applications
- ☐ Recordkeeping and field surveying procedures

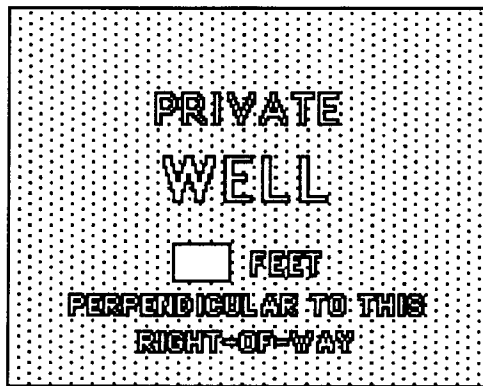
SPILL RESPONSE PROCEDURES

- ☐ Clean-up equipment and materials to be available in the field
- ☐ Procedures for cleaning up spills
- ☐ Agencies and firms that will respond to large spills
- ☐ Procedures for contacting local officials
- ☐ Determination of financial responsibility for clean-up costs
- ☐ Coordination with local Emergency Planning Committees, hazardous waste coordinators, and fire departments

ALTERNATIVE LAND MANAGEMENT

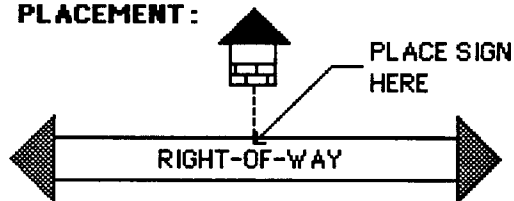
- ☐ Description of alternative land uses and management practices that could be employed on the ROW
- ☐ Procedures for public to arrange alternative land uses vegetation management practices
- ☐ Boilerplate letters of agreements and contracts
- ☐ Explanation of reasons why alternative land uses and management may be inappropriate if applicable

FIGURE 8

PRIVATE WELL
SIGN REQUIREMENTS

REQUIREMENTS: WHITE LETTERING ON BLUE [] BACKGROUND.

RECOMMENDATIONS: CONSTRUCT SIGN WITH WEATHER RESISTANT MATERIAL. MINIMUM DIMENSIONS SHOULD BE 8.5"x11".

PLACEMENT:

Private well owners will bear the onus of marking the location of their wells with a sign if they are within 100 feet of a right-of-way. The sign must be five feet above the ground and in plain view. The sign must read WELL in white letters on a blue background and indicate the distance from the ROW to the well (see Figure 8). The owner must also report the location of the well to the local Board of Health, mayor, or Board of Selectmen so that it can be placed on the state map. A local private well inventory would also facilitate other drinking water protection efforts. This information would be useful in subdivision, site plan, and other environmental reviews.

Two wetlands categories are defined as sensitive areas. Surface water is defined as any standing or flowing water which is not a public water supply.

Wetlands include all resource areas protected by the Wetlands Protection Act except land subject to flooding.

The ROW operator is responsible for delineating wetland boundaries. Requests for Determination of Applicability must be submitted to conservation commissions to certify the boundaries. It would be best for commissions to accompany the applicant during the actual delineation. Disagreements over the placement of boundary markers can be resolved in the field and before the formal Request is filed. Public utilities will probably, but not necessarily, qualify for the Wetlands Protection Act maintenance exemption. It is up to conservation commissions to decide whether an activity is exempted. In any event, DEQE recommends that utilities file Requests for Determination. Commissions should urge the Pesticide Bureau to require utilities to mark wetlands in the field. Under no circumstances can herbicides be applied within 10 feet of standing water. Utilities may apply herbicides in wetlands where standing water is not present if the Pesticide Bureau concurs with a study to be submitted by utilities which finds herbicides cause less damage to wetlands than mechanical controls. Public commentators, especially conservation commissions, should note whether the ROW runs through the estimated habitat of rare or endangered wetlands species. These areas are shown on the Estimated Habitat Maps prepared by the state Natural Heritage Program and distributed to each commission. Some municipalities do not have any identified rare or endangered wetlands species. This information could be used to support additional conditions on herbicide use in sensitive areas.

Inhabited (referred to as "habitated" in the regulations) and agricultural areas located within 100 feet of ROWs are protected. While spraying is not prohibited,

TABLE 7**BASIC STEPS OF
INTEGRATED PEST MANAGEMENT (IPM)**

1. Identify the species that will be targeted for control and beneficial species that will be encouraged.
2. Monitor field populations of targeted and beneficial species.
3. Determine population levels of target species that can be tolerated and levels that require action.
4. Evaluate all potentially available control methods.
5. Select most appropriate controls.
6. Time controls for maximum effectiveness.
7. Evaluate program's effectiveness.

applications must be by low pressure methods and no more than once every twelve months. Inhabited areas include those areas where people generally work, live, or gather including schools, hospitals, parks, dwellings, and recreational facilities.

Agricultural areas include land that is cultivated or agriculturally managed such as greenhouses, gardens, orchards, fields, and pastures. Public reviewers might consider submitting maps that approximately locate inhabited and agricultural areas. USGS topographic maps often show ROWs. These maps could be marked to indicate which segments of the ROWs come within 100 feet of these sensitive areas.

Operational Guidelines. Most ROW operators contract with outside firms to perform vegetation management work. The VMP should describe the guidelines which contractors and field personnel will be required to follow to ensure protection of sensitive areas and proper herbicide use. The VMP Checklist (see Table 6)

includes several points that should be included in this section.

IPM Program. To minimize herbicide use, Integrated Pest Management (IPM) strategies should be followed by the ROW operator. In general, an IPM approach determines the optimum control program by assessing management needs through field monitoring, specifying when control is warranted, evaluating all available controls, using herbicides in a selective manner if necessary, choosing the least-toxic material, timing the applications to maximize effectiveness, and keeping careful records of field conditions and herbicide use.

The types of data which will be collected in the field to determine vegetation management needs should be listed and should include species, average height, stem densities, location, treatment recommendations, and ROW conditions. Certified and licensed applicators are also required to keep records of their herbicide use. This information could be used to develop a baseline against which future applications could be compared. Hopefully, such records would indicate decreasing herbicide use over time.

Alternative Land Management. The VMP must present alternative means of managing ROWs to minimize and eliminate herbicide use. The VMP should describe programs to allow land owners or abutters to manage the ROW with non-chemical methods and describe alternative land uses that would preclude the need for herbicides such as pastures, gardens, and recreational facilities. It should be kept in mind that some alternative land uses, such as Christmas tree farms, might increase pesticide use in a particular area. The ROW operator is not required to implement an alternative land management program. However, some operators have already

TABLE 8

YOP CHECKLIST

MAPS

- ☐ Complete inventory and accurate location of sensitive areas in each municipality
- ☐ Appropriate scale and symbols
- ☐ Note locations of rare wetlands wildlife habitat as shown on the Natural Heritage Program's Estimated Habitat Maps

PERSONNEL

- ☐ Name of contractor, address, telephone number
- ☐ ROW operator supervisor, address, telephone number

FIELD PROCEDURES

- ☐ Identification of target vegetation and desirable vegetation
- ☐ Procedures for identifying sensitive areas
- ☐ Procedures for mixing and loading herbicides
- ☐ Sources of water and safeguards to prevent contamination
- ☐ Disposal of herbicide wastes

HERBICIDE INFORMATION

- ☐ Names of herbicide products, active ingredients, carriers, and adjuvants
- ☐ Application rates
- ☐ Application equipment
- ☐ Herbicide fact sheets approved by the Pesticide Bureau

- ☐ EPA/DEQE hazardous waste generator number
- ☐ Disposal contractor
- ☐ Destination of waste

instituted these programs in response to abutters' concerns. Boilerplate agreements with abutters should be included in the VMP.

Spill Response. Herbicides will be carried on ROWs in dilute and concentrated form. In the event of an accidental spill it will be necessary for the applicator to clean up the spill and report it to the proper authorities. The VMP should describe the procedures to be followed in the event of a spill and list the materials that will be on hand to clean it up. Procedures for contacting local, state, and federal agencies and hazardous waste response firms should be described and incorporated into the operating guidelines.

EVALUATING A YEARLY OPERATIONAL PLAN

Once the 5-year VMP is approved, the ROW operator must submit a Yearly Operational Plan, or YOP, to the Pesticide Bureau for each year in which herbicide applications are proposed. The YOP will be based on the VMP and will include more specific information about operational details.

Maps. The maps will be the most important element of the YOP. The scale and accuracy of the maps should be adequate to enable the applicator and municipal officials to identify the location and type of sensitive area in each town. Public reviewers should evaluate each map's scale, symbols, accuracy, and completeness.

Herbicide Information. The YOP must identify the specific herbicides chosen by the ROW operator, the application rates, carriers (e.g., oil, water, solvent), and adjuvants (i.e., sticking agents, drift control agents, etc.). The

herbicide should be chosen from the state list of herbicides. If one or more herbicide does not appear on the state list then the YOP may be rejected. The YOP should also include state-approved herbicide fact sheets. These fact sheets will be sent to each community when the 21-day notices are given.

Personnel. Contact persons representing the ROW operator and its vegetation management contractor should be identified. Mailing addresses and telephone numbers should be provided. These persons can be contacted for more information.

Field Procedures. A list of target species must be provided. The species can be compared to the chosen herbicides to determine if they are appropriate.

Flagging procedures for sensitive areas should be described. In some cases, ROW operators may propose that sensitive areas be identified by sight without the use of markers. Public reviewers should evaluate the procedures to determine whether they are adequate. Railroads will probably use a system of permanent markers affixed to rail ties. Local officials should become familiar with the system so that their proper placement can be verified. Whether markers are used or not, a "point person" should proceed ahead to alert applicators to upcoming sensitive areas.

Procedures for mixing and loading herbicides should be detailed. Mixing and loading may occur at a central location or in the field. If these activities occur in the field, then it is probable that local sources of water will be used to fill tanks. Procedures to prevent backsiphonage and spill should be described. Procedures for the disposal of herbicide wastes, including containers and excess material, should be discussed. No wastes should be disposed

of in the field. The location where equipment will be cleaned and the destination of wastes should be specified.



OTHER ISSUES

APPEALS

Any person who is aggrieved by a decision of the Pesticide Bureau to approve, reject, modify or revoke a VMP or YOP may request an adjudicatory hearing from the Pesticide Board. The appeal must be sent in writing to the Pesticide Bureau by certified mail or hand delivery within 21 days after the date of decision or notice by the the Bureau. The appeal must also be sent to the ROW operator. The appeal should state the facts and reasons to support the argument that the contested decision is inconsistent with the ROW regulations (333 CMR 11.00). The type of relief sought should also be stated.

MUNICIPAL NOTIFICATION

Under Section 6B of the Pesticide Control Act, ROW operators must notify conservation commissions and mayors, city managers, or selectmen by registered mail 21 days in advance of herbicide applications. This requirement continues to be in effect. The Pesticide Board regulations expand the information required to accompany the notice and have included boards of health as recipients. Municipalities must receive a copy of the approved YOP, the approximate dates on which the applications will commence and conclude, copies of the state-approved herbicide fact sheets, and the name and address of the application contractor. If proper notification is not received, herbicide applications may not be made.

TOUCH-UP APPLICATIONS

While sensitive areas are protected in part by limiting the frequency of application to once every 12 or 24 months, the Pesticide Board regulations provide for "touch-up applications". These applications are intended to be limited followup treatments in areas where the initial program failed to achieve the desired goal. Municipalities must be notified in advance and the area of touch-up treatment is limited to no more than ten percent of the ROW area in any town or city. The Pesticide Bureau may impose additional conditions it deems necessary to protect public health and the environment.

SUNSET PROVISIONS

The Pesticide Board regulations "sunset" or become automatically void on July 10, 1989 unless they are reapproved by the board. It is assumed that the regulations will not be allowed to lapse. Since the Pesticide Board will have to reconsider the regulations in 1989, it will be an opportunity to review the adequacy of some of the provisions, particularly the sensitive area setbacks. In the event that the Pesticide Board allows these regulations to sunset, the herbicide amendments to the Wetlands Protection Act regulations would also become void.

WETLANDS BYLAWS AND OTHER LOCAL CONTROLS

The application of home rule wetlands bylaws to ROW herbicide spraying is not affected by the state regulatory program. Conservation Commissions in municipalities with local bylaws will need to determine how they will treat this activity. Since wetlands bylaws are not intended to regulate only pesticides, it does not appear that the

"Wendell Decision" issued by the Supreme Judicial Court, which invalidated the town of Wendell's pesticide bylaw and board of health regulation on pesticides, would affect their validity. However, town counsels should be consulted.

Other local controls such as board of health regulations and zoning bylaw requirements would also continue to apply if they are consistent with the Wendell Decision.

HERBICIDES

PROBLEMS AND CONCERNS

All pesticides, of which herbicides represent one class, are potentially toxic. Specific herbicides vary in their particular toxicities in terms of the types of effects they may cause and the severity of the effects. Some herbicides can cause acute, or short-term, health effects while others represent chronic, or long-term, health risks. Acute health effects include headaches, nausea, dizziness, tremors, and, in extreme cases, death. Chronic effects include birth defects, cancer, reproductive impairment, neurological damage, and genetic mutations. Some herbicides may leach into groundwater, run off into surface waters and wetlands, or adversely affect wildlife.

Toxicity in itself does not lead to health effects. Exposure to a toxin must also occur at sufficient levels. In regard to rights-of-way herbicide applications the potential routes of exposure include contamination of drinking water, skin contact with and inhalation of herbicide drift, involuntary skin contact with treated vegetation, and ingestion of vegetation carrying herbicide residue.

In some cases there has been

strong scientific evidence that demonstrated significant toxic effects caused by certain pesticides. The herbicide aminotriazole, which was used on rights-of-way and as a control for poison ivy, was banned in 1985 by the Pesticide Board Subcommittee. The herbicide 2,4,5-T, which was used commonly on ROWs, was banned from this use by the EPA in 1979. In most cases, the lack of adequate testing severely limits the ability of government agencies, applicators, and the public to evaluate the risks. General surveys of pesticide data bases have found them to be undermined by pervasive gaps in essential testing categories. A 1983 report prepared for a U.S. House Agriculture Subcommittee found that of a sample of 60 pesticides, 48 percent lacked adequate studies of tumor-causing ability, 38 percent lacked birth defects data, 48 percent lacked data on reproductive impairment, and 90 percent lacked data on genetic mutations (U.S. House of Representatives, 1983).

Municipalities, citizens, and pesticide users have relied on the federal government to review pesticides for public health and environmental risks. As noted previously, the base of scientific information has many gaps which limit the reliability of current risk assessments when they are possible to perform. Over the last several years, the EPA has begun to systematically review pesticides, require manufacturers to submit needed data, and take regulatory actions. Nevertheless, the task is formidable. There are 50,000 pesticide products registered in the United States. These products are composed of various combinations of approximately 600 active ingredients and 1200 inert ingredients. Active ingredients are the component which causes the pesticidal action and the inert ingredients facilitate that action. For example, the product Roundup contains an active ingredient named glyphosate and inert ingredients

such as the surfactant polyoxethylene-amine. The term inert may sound innocuous but the ingredients may also be toxic. Inert ingredients in pesticide products have included asbestos, benzene, and formaldehyde.

The U.S. General Accounting Office (GAO) estimates that at the current rate of review the EPA will not complete the review of all 600 active ingredients until the year 2005 (U.S. GAO, 1986). In 1987 the EPA reported that 100 inert ingredients are known or suspected hazards, 300 are generally considered safe, and the remaining 800 are untested (Kistner & Porterfield, 1987). EPA will act to remove the known hazards, but the fate of the majority is less certain.

STATE LIST OF RECOMMENDED HERBICIDES

The Pesticide Bureau and the DEQE under a Memorandum of Understanding are cooperatively reviewing herbicides submitted by ROW operators for risk assessments. Some herbicides will be approved for use in sensitive areas. Outside sensitive areas, any herbicide registered in Massachusetts for rights-of-way vegetation control may be used. Under the agreement, herbicides will be subject to a three stage review process. In stage 1, the mobility of each herbicide will be assessed; in stage 2 the toxicity of herbicides found in stage 1 to be immobile will be evaluated; and in stage 3 toxicological and environmental fate data on the products containing immobile nontoxic herbicide active ingredients will be reviewed. The herbicides which survive all three stages will be placed on the final list. The list may be requested from the Pesticide Bureau or DEQE Division of Wetlands and Waterways. According to the regulations, the list is supposed to be available by August 15th of the year preceding proposed herbicide spraying.

A specific public comment process for the list of recommended herbicides was not provided for in the regulations. Nevertheless, it would be appropriate for public reviewers to comment on the choice of herbicides presented in the Yearly Operational Plans. Persons who have information or comments on specific herbicides may submit these items at any time to the Pesticide Bureau or DEQE.

In the past, some ROW operators have justified herbicide use with questionable rationales. One argument states that herbicides are less toxic than common substances such as table salt. Such a statement is faulty because it is based on the comparison of acute toxicities as measured by the LD50s. However, herbicides may present both acute and chronic toxicological risks. For example, the herbicide aminotriazole has an LD50 of about 25,000 mg/kg which is considered virtually non-toxic and less toxic than salt in acute terms. However, several studies show aminotriazole is a carcinogen which the basis for the state ban.

The other justification made by some ROW operators has been that their products are registered by the EPA and the state, and are therefore implied to be safe. As noted previously, these registrations are not based on adequate scientific reviews because the necessary data has not been available.

At the time of this writing, 10 herbicide active ingredients contained in 20 products have been submitted by ROW operators for state review. The final state list has not been issued. The following summaries of the 10 active ingredients is intended to provide useful background information to the users of this Guide. The summaries are based on available information, but are not intended to represent comprehensive evaluations.

DICAMBA

Trade Name: Banvel

Chemical Name: 3,6-dichloro-o-anisic acid

Manufacturer: Velsicol Chemical Corp.

Mode of Action: Dicamba is a pre- and post-emergent, selective herbicide that interferes with protein synthesis during germination.

Summary: Dicamba is slightly acutely toxic (Harrison, 1985). EPA has required the submittal of carcinogenicity and chronic feeding studies. Reproductive impairment and birth defects were not indicated by the studies accepted by EPA. There is a potential for certain isomers of dioxin, but not TCDD, to form during the manufacturing process. Nitrosamines also appear to develop in dimethylamine salt formulations (EPA, 1983). Dicamba is considered a potential groundwater leacher (Cohen, 1985).

2,4-D

Trade Name: Weedar, Weedone, Tordon

Chemical Name: 2,4-dichlorophenoxy-acetic acid (2,4-D)

Manufacturer: Dow Chemical Co. and others

Mode of Action: A post-emergent, selective herbicide absorbed through foliage. The herbicide simulates a hormone which kills the plant by causing it to grow too quickly.

Summary: 2,4-D is a controversial herbicide. It is currently being reviewed by the Mass. Pesticide Board Subcommittee. A 1986 epidemiological study found a correlation between the increased

incidence of non-Hodgkins lymphoma in Kansas farmers and exposure to 2,4-D (Hoar et al., 1986). Recently an even stronger finding was reported by another study involving farmers in Nebraska. EPA has decided that the study on Kansas farmers does not warrant regulatory action at this time and has not yet reviewed the Nebraska study. In December 1986, the ChemLawn Corporation, the major professional lawn care company in the United States, suspended its use of 2,4-D in response to the Kansas study (Chemical Regulation Reporter, 1986). In 1980 the EPA required manufacturers to generate a series of new health effects studies. Based on those studies, the EPA finds no evidence that 2,4-D is associated with birth defects or neurological effects. Reproductive toxicity was indicated in one animal study although there were no fertility effects. An increased incidence of brain tumors was indicated in a study which the EPA is evaluating. Further studies on tumor formation, environmental fate, residue chemistry, product chemistry, and ecological effects are to be generated (EPA, 1987). EPA considers 2,4-D to be a marginal leacher (Cohen, 1985). Its environmental mobility may vary with the herbicide's particular chemical form (e.g., ester or salt) (VanDriesche, 1984). In 1981 a state advisory committee of the Departments of Public Health and Environmental Quality Engineering recommended:

"... that 2,4-D use should be restricted to areas in which human exposure can be kept to the minimum. Contamination of open water must be monitored and prevented. ... Stronger consideration must be given to alternative methods for removing unwanted plants" (Telles, 1981).

2,4-DP (DICHLORPROP)

Trade Name: Weedone

Chemical Name: 2-(2,4-dichlorophenoxy) propionic acid

Manufacturer: Several

Mode of Action: Selective, systemic herbicide which is applied to foliage. It works as a growth regulator.

Summary: EPA has not issued a Registration Standard for this herbicide. No further information was located.

FOSAMINE AMMONIUM

Trade Name: Krenite

Chemical Name: ammonium ethyl carbamoyl phosphonate

Manufacturer: Du Pont

Mode of Action: Contact herbicide which inhibits bud development.

Summary: EPA has not issued a Registration Standard for this herbicide. The 1985 GEIR review of Krenite reported that it has a low acute toxicity and limited data indicates that birth defects are not caused. No publicly available carcinogenicity studies were located. Krenite does not appear to be a mutagen. The GEIR stated that more publicly available toxicity data is needed to assess Krenite. Despite its high water solubility, Krenite is considered to have low mobility in soil because of its strong tendency to adsorb to soil particles. Because Krenite tends to stay near the soil surface, erosion or runoff may cause lateral movement. Krenite has a half-life of less than 7 to 10 days (Harrison, 1985).

GLYPHOSATE

Trade Name: Roundup, Rodeo

Chemical Name: N-(phosphonomethyl) glycine

Manufacturer: Monsanto

Mode of Action: Non-selective systemic herbicide absorbed through foliage. It interferes with the formation of amino acids and other plant chemicals.

Summary: Glyphosate has a low acute toxicity (Harrison, 1985). In regard to chronic health effects, the EPA staff considered classifying glyphosate as a Class C carcinogen (equivocal evidence of human carcinogenicity). However, the EPA Scientific Advisory Panel recommended downgrading the rating to Class D (insufficient evidence to classify carcinogenicity) (Chemical Regulation Reporter, 1986). Glyphosate is not considered a potential leacher (Cohen, 1985). EPA has issued a Registration Standard and indicates that the chronic toxicity data base is complete (EPA, 1987). Glyphosate products are registered for general use. The inert ingredients in glyphosate-based products appear to be problematic. A surfactant, MON 0818, in Roundup appears to be toxic to fish (Harrison, 1985).

IMAZAPYR

Trade Name: Arsenal

Chemical Name: 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid

Manufacturer: Cyanamid

Mode of Action: Non-selective systemic herbicide absorbed by leaves and roots. It blocks protein synthesis.

Summary: Imazapyr is a recently developed herbicide. No information was located regarding its toxicity or environmental fate.

METSULFURON METHYL

Trade Name: Escort

Chemical Name: methyl 2-((((4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbonyl)amino-sulfonyl)benzoate

Manufacturer: Du Pont

Mode of Action: Selective systemic herbicide absorbed through leaves and roots. It stops plant growth by inhibiting cell division in meristems.

Summary: Metsulfuron methyl is a recently developed herbicide. No information was located regarding its toxicity or environmental fate.

PICLORAM

Trade Name: Tordon

Chemical Name: 4-amino-3,5,6-trichloro-picolinic acid

Manufacturer: Dow Chemical Co.

Mode of Action: Post-emergent, selective herbicide which disrupts formation of plant tissues by inhibiting protein synthesis.

Summary: EPA issued a Registration Standard in 1985. Data gaps existed for chronic feeding, carcinogenicity, teratogenicity, and mutagenicity. It is reported as a groundwater and surface water contaminant in West Virginia. It is restricted for use by certified and licensed applicators only (Mott, 1986). EPA considers picloram to be a leacher (Cohen, 1985). The 1985 GEIR concluded that picloram has a low acute toxicity. A definitive statement regarding carcinogenicity was not possible due to inadequate data. However, picloram causes benign nodules to form in animal

studies which led the GEIR to state that it should be suspected as a possible carcinogen until further studies demonstrate that the nodules do not progress to malignancy (Harrison, 1985). Hexachlorobenzene and nitrosamines, both carcinogens, are potential contaminants in picloram (Mott, 1986).

SULFOMETURON METHYL

Trade Name: Oust

Chemical Name: methyl 2-(3-(4,6-dimethylpyrimidin-2-yl)ureidosulphonyl)benzoate

Manufacturer: Du Pont

Mode of Action: Broad spectrum herbicide which is rapidly absorbed by leaves and roots. It stops cell division in growing tips of roots and plants.

Summary: Sulfometuron methyl is a new herbicide and no information was located regarding its toxicity and environmental fate.

TRICLOPYR

Trade Name: Garlon

Chemical Name: 3,5,6-trichloro-2-pyridyl oxyacetic acid

Manufacturer: Dow Chemical Co.

Mode of Action: Selective systemic herbicide absorbed by foliage and roots which disrupts the formation of plant tissues.

Summary: EPA has not completed a Registration Standard (EPA, 1987). The 1985 GEIR reported that triclopyr is similar in chemical structure to 2,4,5-T, but is not

contaminated by dioxins. Triclopyr is mildly fetotoxic and can cause adverse reproductive effects according to animal studies. Available data suggests that triclopyr is mobile in the environment (Harrison, 1985).



CONCLUSIONS

Active participation by local officials and citizens in this effort to reduce the use of toxic chemicals is critical. Without local involvement, the ROW operators will not have as much incentive to develop plans that effectively protect sensitive areas and minimize herbicide use.

Property owners with land abutting ROWs or land on which ROW easements are located should seriously consider managing vegetation themselves. Self-management is the surest way of avoiding unwanted herbicide applications.

You are encouraged to contact MACC and the Massachusetts Audubon Society for further assistance. As this new program is implemented, there are sure to be some problems which need to be addressed through the DEQE and the Pesticide Bureau.



GOVERNMENT AGENCIES

PESTICIDE BUREAU

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100 Cambridge Street
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DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

One Winter Street
Boston, MA 02108

Division of Wetlands & Waterways
(617) 292-5695

Office of Research & Standards
(617) 292-5570

Division of Water Supply
(617) 292-5509

DIVISION OF FOOD & DRUGS

Department of Public Health
305 South Street
Jamaica Plain, MA 02130
(617) 522-3700

NATURAL HERITAGE PROGRAM

Division of Fisheries & Wildlife
100 Cambridge Street
Boston, MA 02202
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MASSACHUSETTS COOPERATIVE EXTENSION SERVICE

University of Massachusetts
Fernald Hall
Amherst, MA 01003
(413) 545-2283



TOXICOLOGY INFORMATION

NATURAL RESOURCES DEFENSE COUNCIL (NRDC)

122 East 72nd Street
New York, NY 10168
1-800-648-6732 (toll free)

RACHEL CARSON COUNCIL

8940 Jones Mill Road
Chevy Chase, MD 20815
(301) 652-1877

NATIONAL PESTICIDE INFORMATION NETWORK

Texas Technical University Medical School
Lubbock, TX 79430
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PESTICIDE COORDINATOR

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ENVIRONMENTAL ORGANIZATIONS

MASSACHUSETTS AUDUBON SOCIETY

Environmental Affairs Department
South Great Road
Lincoln, MA 01773
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MASSACHUSETTS ASSOCIATION OF CONSERVATION COMMISSIONS

Lincoln Filene Center
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NATIONAL COALITION AGAINST THE
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NORTHWEST COALITION FOR
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ALTERNATIVES

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