

THE NARRAGANSETT ELECTRIC COMPANY

RIPUC Dkt. No. 3732

Supplemental Testimony of

David J. Beron, P.E., P.M.P.

July 7, 2006

SUPPLEMENTAL TESTIMONY OF DAVID J. BERON, P.E., P.M.P.

1 INTRODUCTION

2 Q. Please state your name and business address.

3 A. My name is David J. Beron. My business address is 25 Research Drive, Westborough,
4 Massachusetts 01582.

5 Q. Have you previously filed testimony in this docket?

6 A. Yes. I filed prefiled testimony on behalf of National Grid on April 14, 2006.

7 Q. Have you reviewed the prefiled testimony of Gregory L. Booth (“Booth”) filed on behalf
8 of the Division of Public Utilities and Carriers (“Division”)?

9 A. Yes, I have.

10 Q. Have you reviewed the Supplemental Testimony of Melissa Scott in this Docket?

11 A. Yes, I have.

12 Q. What steps did National Grid take to provide the required conductor clearances for the G-
13 185S line at the higher emergency temperature as discussed in Ms. Scott’s supplemental
14 testimony?

15 A. To facilitate the operation of the G-185S Line at a 120° C emergency operating
16 temperature, National Grid commissioned a Laser Imaging Detection and Ranging
17 (“LIDAR”) survey of the transmission line. This LIDAR survey identified a number of
18 “hard infringements” (potential ground-clearance violations) and a number of “soft
19 infringements” (potential vegetation-clearance violations) which could exist at the higher
20 emergency operating temperature of 120° C.

1 It was determined that a number of spans of the line between Old Baptist Road Tap and
2 West Kingston Substation would have ground clearance violations at a 120° C emergency
3 operating temperature, and additional spans could potentially require vegetation
4 management to correct clearance infringements to the underlying vegetation.

5 In order to address the identified “hard infringements” and increase ground clearance, 39
6 of the 149 total structures were replaced in-kind using wood poles typically 5 feet taller
7 than the existing structures.

8 Q. What actions did National Grid take to address the “soft infringements” identified by
9 the LIDAR survey of the G-185S line?

10 A. National Grid utilizes an aggressive vegetation management policy on its rights-of-way.
11 The “soft infringements” identified by the LIDAR survey have some margin of error
12 based upon the density and consistency of the vegetation being surveyed. However, out
13 of an abundance of caution, the list of potential “soft infringements” for the G-185S
14 circuit was used by our system arborists to identify spans of the transmission line where it
15 would be prudent to perform a field review of the vegetation conditions prior to summer
16 peak load conditions. Our arborists conducted field review of the identified spans and
17 took corrective action, where necessary, prior to the 2005 summer peak.

18 Q. Please explain the Company’s vegetation management practices.

19 A. The vegetation in the ROW is treated to insure that tall growing species (hardwood and
20 coniferous trees) do not reach growth heights in excess of 18 feet. Our cycle of treatment
21 is 5 years on this segment of ROW. Treatment includes a crew walking down the ROW
22 in the winter cutting any hardwood greater than 12 feet high and treating the stump with a

1 herbicide. Non-sprouting conifers greater than two feet high are cut and diced. Sprouting
2 conifers have the stump treated. Later in the summer the crew will once again walk down
3 the ROW and apply foliar treatment to hardwoods shorter than 12 feet.

4 Sideline trees are trimmed on a cycle dependant on growth habits, typically 5 to 10 years.

5 Road crossings are now being cleared to facilitate a view down the ROW for safety

6 reasons. On road crossings which cannot be cleared, tree height is maintained at

7 distribution height. Yard trees that pose a risk to the transmission line are cut following

8 negotiations with the homeowner.

9 Sensitive areas in the ROW are treated at a time when endangered wildlife species are not

10 breeding or susceptible to treatment methods. Waterways have a mandatory setback for

11 treatment.

12 More details on the company's vegetation management practices can be found in the

13 National Grid Transmission Forestry Specifications for Right of Way Vegetation

14 Management (Attachment DJB-1 to this testimony).

15 Q. Does this conclude your testimony?

16 A. Yes, it does.

The Narragansett Electric Company
RIPUC Dkt. No. 3732
Witness: David J. Beron, P.E., P.M.P.

ATTACHMENTS

DJB-1 National Grid Transmission Forestry Specifications for Right of Way Vegetation Management (2006)

The Narragansett Electric Company
RIPUC Dkt. No. 3732
Witness: David J. Beron, P.E., P.M.P.

ATTACHMENTS

DJB-1 National Grid Transmission Forestry Specifications for Right of Way Vegetation
Management (2006)

National Grid
Transmission Forestry
Specifications for Right-of-Way Vegetation Management
2006

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 1 of 36
	Date:	November 1, 2005

FOREWORD

This Specification for vegetation management documents the objectives, strategies, practices and procedures for vegetation management on National Grid companies' electric right-of-ways. This Specification also defines the responsibilities of Company personnel and contractors, identifies procedures to be followed by contractors performing all work and defines the clearance requirements between conductors and vegetation acceptable to the Company for maintaining reliable electric transmission service.

Questions or inquiries regarding information provided in this document should be referred to the National Grid Manager of Transmission Forestry.



Alan Robb, Vice President

Transmission Network Asset Management

Date: 11/22/05



Thomas B. Sullivan, Manager

Transmission Forestry

Date: 11/22/2005

Record of Change		
Date of Review/Revision:		
Revision	Date	Description
1	December 20, 2001	Updates
2	December 9, 2002	Updates
3	April 22, 2004	Updates
4	November 1, 2005	Complete review and total rewrite to integrate NE and NY operations.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 2 of 36
	Date:	November 1, 2005

TABLE OF CONTENTS

1.0	Introduction.....	5
1.1	Purpose.....	5
1.2	Scope	5
2.0	Definitions.....	5
3.0	Vegetation Management Program	9
3.1	Objectives	9
3.2	Strategy	9
	3.2.1 Contractors.....	10
	3.2.2 Imminent Threats of Outage.....	10
	3.2.3 Inquiries and Complaints from Landowners and/or Public.....	10
3.3	Clearance Standards.....	10
	3.3.1 At Time of Vegetation Management Clearance Distances.....	10
	3.3.2 Minimum Clearance Distances	11
3.4	Inspections of Right-of-Way Vegetation Conditions	11
4.0	National Grid Roles and Responsibilities.....	12
4.1	Transmission Owner	12
4.2	Transmission Forestry.....	12
	4.2.1 Prepare documents.....	12
	4.2.2 Obtain Permits/Plans/Approvals.....	13
	4.2.3 Procure Services.....	13
	4.2.4 Prepare Specification	13
	4.2.5 Bidding.....	13
	4.2.6 Purchase Order.....	13
	4.2.7 Maintain Transmission Forestry GIS.....	13
	4.2.8 Notifications.....	14
	4.2.9 Operations Monitoring.....	14
	4.2.10 Contractor Performance.....	14
5.0	Contractor Duties and Responsibilities.....	14
5.1	Environmental and Safety Compliance	14
5.2	Qualifications.....	15
5.3	Training.....	15
5.4	Commencement of Operations	16
5.5	Permits/Plans/Approvals.....	16
5.6	Notifications to National Grid	16
5.7	Notifications to Customers/Landowners.....	17
5.8	Documentation.....	17
5.9	Interaction with Public.....	17
5.10	Demands that a Treatment Operation Cease.....	18
5.11	Access	18

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 3 of 36
	Date:	November 1, 2005

5.12	Site Conditions.....	18
5.13	Herbicides	19
	5.13.1 Handling, Mixing, Loading and Labeling Herbicide Concentrates.....	19
	5.13.2 Treatment Width	19
	5.13.3 Treatment Effectiveness.....	20
5.14	Danger Trees.....	20
5.15	Wetlands and Sensitive Areas.....	20
5.16	Railroads	20
5.17	Native American Lands	21
5.18	Chainsaw Bar Lubricants	21
5.19	Equipment.....	21
5.20	Site Restoration.....	21
6.0	Vegetation Management Practices and Procedures	22
6.1	Practices and Procedures - Maintenance.....	22
	6.1.1 Right-of-Way Floor Program.....	22
	6.1.1.1 Selective Vegetation Management	22
	6.1.1.2 Non-Selective Vegetation Management	23
	6.1.1.3 Vegetation Management in Visual Buffers.....	24
	6.1.1.4 Vegetation Management in Protective Buffers.....	24
	6.1.2 Right-of-Way Danger Tree Program	24
6.2	Practices and Procedures – New Construction	24
6.3	Vegetation Management Techniques.....	25
	6.3.1 Herbicides	25
	6.3.1.1 Basal Application.....	25
	6.3.1.2 Stump Application (Cut Surface).....	26
	6.3.1.3 Foliar Application	27
	6.3.2 Mechanical.....	30
	6.3.2.1 Hand Cutting.....	30
	6.3.2.2 Mowing.....	30
	6.3.2.3 Selective Mowing	31
	6.3.2.4 Pruning.....	31
6.4	Management of Wood and Brush (Slash)	31
6.5	Mitigation of Impacts.....	32
7.0	Work Precautions.....	33
7.1	Safety	33
7.2	Sensitive Areas.....	34
7.3	Visual and Protective Buffers	34
7.4	Weather.....	35
7.5	Wetlands	36

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 4 of 36
	Date:	November 1, 2005

LIST OF APPENDICES:

- Appendix 1: Summary of Key Specification Requirements
- Appendix 2: National Grid Forester and Control Center Contact Information
- Appendix 3: Notification Materials
- Appendix 4: National Grid Environmental Policy
- Appendix 5: National Grid Contractor Safety Requirements
- Appendix 6: New York Inventory Codes
- Appendix 7: Herbicide Mixes
- Appendix 8: Contractor Audit Form
- Appendix 9: Border Zone / Wire Zone Vegetation Lists

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 5 of 36
	Date:	November 1, 2005

1.0 Introduction

1.1 Purpose

The purpose of this Specification is to document the requirements for vegetation management on transmission and distribution right-of-ways for National Grid. This Specification defines:

- Objectives, strategies and approved practices and procedures for all phases of vegetation management on electric right-of-ways;
- Clearance requirements between conductors and vegetation acceptable to National Grid for maintaining reliable electric transmission service;
- Responsibilities of Company personnel and contractors;
- Procedures to be followed by contractors performing all work within the scope of this Specification.

1.2 Scope

The requirements of the Specification for vegetation management apply to all contractors working on National Grid electric right-of-ways.

2.0 Definitions

Annual Work Plan – Identifies the vegetation management work that will be carried out in a fiscal year, April 1 to March 31

Article VII Right-of-way--a right-of-way approved for construction and maintenance under the Article VII regulations of the N.Y.S. Public Service Commission. These lines generally have additional environmental protections and restrictions associated with access, vegetative screening, integrated management, etc.

Basal Application--Herbicide application method in which the lower portion of the target species stems and root collar is completely covered by the herbicide solution.

Capable Species--Tree and shrub species that have the ability to grow into the minimum clearance distance from conductors.

Clearance Distances – 1) the At Time of Vegetation Management (ATVM) Clearance Distance from vegetation, in a radius around the conductor, to be achieved at the time of vegetation management and 2) Minimum Clearance Distance, in a radius around the conductor, between conductors and vegetation to be maintained under all rated electrical operating conditions.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 6 of 36
	Date:	November 1, 2005

Voltage	Clearance Distance At Time of Vegetation Management	Minimum Clearance Distance
23 to 46kV	12 feet	2 feet
69kV	14 feet	2 feet
115kV	18 feet	4 feet
230kV	22 feet	6 feet
345kV	26 feet	10 feet
450kV DC	28 feet	12 feet

Forestry GIS – Transmission Corridor Manager Forestry Geographic Information System. The following abbreviations are employed for Land Use Codes:

Abbreviation	Definition
ACC	Access: Off right-of-way access road
CRP	Crop: Cropland in active cultivation
FLD	Field: Open mowed lawns, hay fields, etc.
FOR	Forested Land
NOV	No Vegetation: Gravel pit, parking lot, etc.
NUR	Nursery: Maintained nursery stock
ORC	Orchard: Fruit tree orchard
OWG	Owner General: General information about certain landowners
OWN	Owner No Herbicide: Area where herbicide is not used, per landowner agreement
PAS	Pasture: Animal pasture
PTN	Point Note: Notes about certain off right-of-way conditions
PRW	Private Well: Private water supplies, encased or open spring
RDX	Road Crossing: Special road crossing buffer where trees are maintained
RVX	River Crossing: Certain river crossings where full-sized trees are maintained
SCH	School: Public or private school land where herbicide is prohibited
SWS	Surface Water Supply: Public surface water supply – reservoirs and tributaries
XTR	Christmas Trees: Maintained Christmas tree farms
WET	Wetlands
WWS	Well Water Supply: Public well water supplies
YRD	Yard: Residential or commercial yards with maintained trees

Hand Cutting--Vegetation management method in which woody vegetation is felled through the use of hand tools, including chainsaws and brush saws.

Hazard Tree – Danger trees which due to species and/or structural defect are likely to fail and fall in to the electric facility.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 7 of 36
	Date:	November 1, 2005

Herbicide--Chemical used to control, suppress or kill plants or severely interrupt their normal growth processes.

Incompatible Vegetation --Species of vegetation, trees and certain tall-growing shrubs, that have mature height great enough to grow within the Minimum Clearance Distances.

Integrated Vegetation Management--IVM is an adaptation of Integrated Pest management (IPM) where the pest is tall growing, undesirable vegetation. IPM/IVM is a system of controlling pests in which pests are identified, action thresholds considered, all possible control options evaluated and selective, physical, biological and chemical controls are considered. When chemical controls become necessary to control and prevent the growth of undesirable, tall growing woody species, the Company is committed to employing selective, targeted applications. These treatments shall use approved herbicide products and mixtures that target specific plants or plant communities in a manner calculated to control and eliminate the tall-growing, undesirable woody species, while preserving as much of the smaller, compatible woody shrub and herbaceous vegetation as practicable.

ISO--Independent System Operator

NERC -- North American Electric Reliability Council

NH PES--New Hampshire Pesticide Bureau

NPCC - Northeast Power Coordinating Council

NY DPS--New York Department of Public Service

Non-selective Treatment --the broadcast application of approved herbicides products and mixtures to all woody vegetation.

Pasture--Fenced area used for grazing livestock.

Pruning-- the cutting and removal of tree branches to provide specified clearance distance between vegetation and the conductors. See A.N.S.I. A300 for additional detail.

Removal--Felling or killing of undesirable vegetation.

RI DEM--Rhode Island Department of Environmental Management.

Right-of-Way -- A corridor of land over which electric transmission lines are located. The companies may own the land in fee, own an easement, or have certain franchise or license rights to construct and maintain electric facilities.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 8 of 36
	Date:	November 1, 2005

Selective Mowing--Mowing small areas of high-density target species, or dense woody vegetation encroaching upon roadways or trails to structures or adjacent to structures.

Selective Treatments--Removal of individual undesirable woody plant species through the use of a controlled vegetation management method.

Sensitive Area-- Areas on right-of-ways where legal, visual, or environmental impacts/concerns require compromises to the general IVM policy.

Slash--All branches, tops, small diameter main stems and debris resulting from any cutting operation

Stump Application--Herbicide application method in which the herbicide is applied only to the freshly cut surface of the stump of the target tree

"T" Sheet--Strip map of a right-of-way showing line features.

Transmission--includes all electric lines used to transport electricity between various generation, switching, and distribution substations.

Tree Removal--the cutting and felling of trees, including wood and brush disposal. Removal includes the use of approved herbicides to enable the chemical removal of the target plant(s) from the right-of-way.

Utility Forest -- The forested areas within or adjacent to right-of-ways that are tall enough or may grow tall enough to impact the reliability of the transmission facility.

VMP--Vegetation Management Plan

VT DAR Vermont Department of Agriculture

Visual Buffer --Areas of vegetation preserved on the right-of-way, on both sides of selected improved road crossings, yards, for the purpose of minimizing the visual impacts and linear view of the right-of-way for motorists.

Water --standing or running water, existing at the time of maintenance operations, which has impact outside the right-of-way.

Wire Zone/Border Zone--the wire zone is defined as that portion of the right-of-way floor that is situated either directly beneath the conductor area or for a distance extending approximately ten (10) feet to either side of the conductor. The border zone is that portion of the right-of-way floor situated to the outside of the wire zone extending to the right-of-way edge. It is sometimes referred to as a transition zone between the wire zone and the adjacent forest edge. The wire zone mid-span is the portion of the span where the conductor is at or near its lowest ground clearance distance, generally 60-70% of the span length.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 9 of 36
	Date:	November 1, 2005

YOP – Yearly Operational Plan

3.0 Vegetation Management Plan

3.1 Objectives

The primary objective of National Grid's vegetation management plan (VMP) is to ensure that vegetation does not cause outages. Other objectives include providing a clear and safe work space and access for transmission maintenance activities

3.2 Strategy

National Grid's strategic approach to vegetation management within the right-of-way is to establish and maintain right-of-ways that are largely clear of all incompatible vegetation while maintaining a stable low-growing plant community that is pleasing to the eye and beneficial to wildlife. National Grid's strategic approach to manage vegetation adjacent to the right-of-way is to prune and/or remove danger trees and/or hazard trees where property rights allow vegetation management work.

Right-of-ways that are largely clear of incompatible vegetation present a very low risk of vegetation caused outages. Vegetation adjacent to right-of-ways (danger and hazard trees) presents a greater risk of outages. The risk is primarily related to 2 non-biotic variables, 1) distance from conductor to the adjacent tree line, and 2) conductor distance above the ground; and 3 biotic factors; 1) height of trees, 2) tree species, and 3) tree health and condition. National Grid seeks to mitigate risk of outages from trees adjacent to the right-of-way through site specific management of these variables.

Vegetation management work on transmission and distribution right-of-ways is organized into two programs:

- Right-of-Way Floor Program – management of vegetation within the right-of-way corridor, and
- Right-of-Way Danger Tree Program management of vegetation adjacent to the right-of-way corridor.

To achieve its vegetation management objectives, National Grid utilizes an Integrated Vegetation Management approach which emphasizes selective herbicide use to control incompatible vegetation. IVM integrates the use of various methods of herbicide applications and non-herbicide mechanical vegetation management methods described in Section 6.0 and is used on both the

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 10 of 36
	Date:	November 1, 2005

right-of-way floor and the adjacent utility forest. The IVM program includes the use of herbicides (applied as Basal Application, Stump Application and Foliar Application), Hand Cutting, Mowing, Selective Mowing and Pruning methods.

3.2.1 Contractors

Appropriately certified and qualified contractors are retained to carry out nearly all hands-on vegetation management work on National Grid right-of-ways. Additional information on contractor qualifications can be found in Section 5.2.

3.2.2 Imminent Threats of Outage

National Grid personnel or contractor personnel shall report any observed vegetation-related imminent threats that may cause outages to the appropriate Company Regional Control Center. Control Centers are listed in Appendix 2.

3.2.3 Inquiries and Complaints from Landowners and/or Public

National Grid companies' representatives respond quickly to any questions or complaints relating to right-of-way vegetation management from the public. Inquiries and or complaints from external parties will be documented and reported to the Transmission Forester.

3.3 Clearance Standards

National Grid specifies clearance distances to be achieved at the time of vegetation management work and minimum clearances to be maintained at all times. Clearance standards established by National Grid below conform to the following regulatory standards and industry guidelines:

- North American Electrical Reliability Counsel (NERC) Vegetation Management;
- National Electric Safety Code (NESC) Rule 218; and
- Applicable State and Independent System Operator vegetation management standards or regulations.

3.3.1 National Grid At Time of Vegetation Management Clearance Distances

When performing right-of-way vegetation management, the following At Time of Vegetation Management (ATVM) Clearance Distances, by voltage, shall be achieved.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 11 of 36
	Date:	November 1, 2005

At Time of Vegetation Management Clearance Distances		
Voltage	Vertical (feet)	Horizontal (feet)
23 to 46kV	12	12 – 38
69kV	14	14 – 42
115kV	18	18 – 50
230kV	22	22 – 50
345kV	26	26 50
450kV DC	28	28 50

ATVM Clearance Distances are greater than the Minimum Clearance Distances specified in 3.3.2. In establishing these clearance standards, National Grid considered site-specific conditions such as operating voltage, IVM techniques, fire risks, tree and conductor movement, species types and growth rates, species failure characteristics, local climate rainfall patterns, line terrain and elevation, location of vegetation within the span, worker approach distance requirements and the expected time frame (cycle) before VM will be repeated at the site.

3.3.2 National Grid Minimum Clearance Distances

Notwithstanding the ATVM Clearance Distances in Table 3.1, the Minimum Clearance Distances specified in Table 3.2, shall be maintained. Minimum Clearance Distances shall be maintained at all times in order to prevent flashover between vegetation and conductors.

Minimum Clearance Distances	
Voltage	Radial Clearance (feet)
23 to 46kV	4
69kV	6
115kV	8
230kV	10
345kV	18
450kV DC	20

3.4 Inspections of Right-of-Way Vegetation Conditions

National Grid Forestry staff is responsible for inspection of vegetation conditions on right-of-ways. Inspections are carried for several purposes including, but not limited to: determination of treatment efficacy of floor herbicide work following work completion by contractors; evaluation of efficacy of floor treatment cycle length; planning danger tree work and patrolling the transmission system to find vegetation conditions that are an imminent threat to the reliability of the electric system.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 12 of 36
	Date:	November 1, 2005

Note: Inspection of floor herbicide work is best carried out the Spring following treatment. This inspection is the responsibility of National Grid.

Bolded text indicates key Specification requirements that are also summarized in Appendix 1.

4.0 National Grid Roles and Responsibilities

4.1 Transmission Owner

National Grid companies own and are responsible for ensuring maintenance of their transmission, sub-transmission and distribution facilities on right-of-ways.

4.2 Transmission Forestry Department

The Transmission Forestry department is responsible for system-wide design, planning, coordination and supervision of all right-of-way vegetation management operations. This includes, but is not limited to, preparing and implementing this Specification, scheduling work, estimating budgets, prescribing herbicides and application methods for each right-of-way, obtaining necessary permits, preparing required notifications, selecting contractors, spot checking treatment crews, and providing technical expertise and liaison between National Grid and landowners, local and state officials, or other interested parties. Transmission Forestry also provides local oversight, coordination and enforcement of vegetation management policy, procedures and this Specification on National Grid transmission right-of-ways. Specific duties are listed below.

4.2.1 Prepare documents

Transmission Forestry is responsible for ensuring that all required internal and external documents, Annual Work Plan, Field Inventory, plans, permits and reports have been developed and submitted to required parties. Key regulatory documents are summarized in table 4.1 below.

Document Required	NERC	MA DAR	RI DEM	NH PES	VT DAR	NY PSC
Long-Term VMP	√	√		√	√	√
Annual Work Plan (YOP)	√	√				
Annual Self-Certification	√					
Permit				√	√	
Annual Report						√

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 13 of 36
	Date:	November 1, 2005

4.2.2 Obtain Permits/Plans/Approvals

Transmission Forestry has responsibility for ensuring that all required state level plans, permits and approvals have been obtained prior to initiating vegetation management activities.

4.2.3 Procure Services

Transmission Forestry has responsibility for ensuring that appropriate contractor services have been procured in order to fulfill the requirements of the Annual Work Plan.

4.2.4 Prepare Specification

Annually, Transmission Forestry updates this Specification, informs the contractor which right-of-ways will be treated, the range of dates of treatment and the vegetation management methods, materials and mixing rates to be used. Company Forestry staff will also provide inventory information, right-of-way maps and other information from the Transmission Forestry GIS.

4.2.5 Bidding

Copies of appropriate maps drawings shall be furnished to all prospective bidders, together with a detailed site-by-site Field Inventory. The drawings and/or inventories may be marked to show additional pruning and tree removal requirements, and areas where completed wood and brush removal will be required. These drawings and inventories will subsequently be incorporated into and become part of the contract.

4.2.6 Purchase Order

Before beginning a treatment operation, the contractor will be sent a Purchase Order, with Terms and Conditions attached, from the National Grid Supply Chain Management (SCM) Department. The Terms and Conditions attached to the Purchase Order are incorporated in this policy and procedures. Contact National Grid Forestry staff if a Purchase Order has not been received by the time right-of-ways are scheduled for treatment. The contractor must return the signed acknowledgment copy of the Purchase Order to the SCM Department before any work is done.

4.2.7 Maintain Transmission Forestry GIS

The Company utilizes a Smallworld based geographic information system as an asset register for all transmission facilities. Facilities include transmission lines and structures, real property information, and Forestry defined right-of-way segments and sites. Forestry segments are the basic unit for tracking and scheduling vegetation management work across the system and range in size from approximately 1 to 40 miles in length and 10 to 1,000 acres in area. Forestry sites are the individual areas within

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 14 of 36
	Date:	November 1, 2005

forestry segments where vegetation management work is described in detail. Sites may be as small as a fraction of an acre or 100+ acres in size. Site details include Land Use Code (see definitions), a description of vegetation, a prescription identifying work to be carried out, and may include landowner information such as name, address, and many other attributes.

The Forestry GIS also includes natural resource and land use data such as Lakes, Ponds, Rivers, Streams and other surface waters, Wetlands, Agricultural areas, Public Water Supplies and Endangered species data available from many state GIS offices. Private Well locations are sought from a variety of sources including, company databases, state databases, local Boards of Health and are mapped in the Forestry GIS utilizing the appropriate Land Use Code. Additional vegetation inventory data is provided in NY. See Appendix 6 for NY inventory codes.

4.2.8 Notifications

Transmission Forestry, will establish procedures for notifying nearby residents of vegetation management activities to be carried out on right-of-ways.

4.2.9 Operations Monitoring

Transmission Forestry monitors various aspects of this Specification. Foresters conduct aerial and ground based patrols, review contractor's use of herbicides, herbicide application rates.

4.2.10 Contractor Performance

Transmission Foresters audit contractor performance including conformance with this Specification, Treatment Effectiveness and compliance with environmental and safety requirements. A Contractor Audit Form is attached as Appendix 8.

5.0 Contractor Duties and Responsibilities

Vegetation management operations must be conducted according to right-of-way specifications and according to the written directives of the Company's Transmission Forestry staff. Failure to do so is grounds for removal of the crew from the treatment site by National Grid companies' Forestry staff and possible termination of the contractor's contract.

5.1 Environmental and Safety Compliance

The Contractor shall comply with all applicable Federal, State and local laws and regulations and with the requirements of all permits and approvals obtained by National Grid.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 15 of 36
	Date:	November 1, 2005

National Grid is committed to minimizing its impacts to the environment and requires its contractors to demonstrate the same level of commitment as National Grid in the management of the environment. National Grid's commitment to the environment is communicated in the National Grid – Environmental Policy, see Appendix 4.

The contractor shall immediately notify the Company of any release of any quantity of oil or hazardous material. The contractor is responsible to make all required notifications of releases to appropriate regulatory agencies and to ensure the release is properly responded to.

National Grid Contractor Safety Requirements establish safety requirements for contractors. This document has been provided during the contractor qualification and bidding process. Highlights of the Contractor Safety Requirements are presented in Appendix 5.

All safety incidents shall be reported to the Company. First call should be to the Forester. One-Call shall be used when Forester is not available.

5.2 Qualifications

Contractor shall utilize only experienced and/or trained workers, who are appropriately licensed or certified. Workers must conduct themselves professionally at all times. **Each herbicide applicator shall hold at minimum, a pesticide applicators license or equivalent, from any state within National Grid service territory and comply with license requirements for the state within which applications are taking place.**

Contractor shall utilize appropriately licensed or certified supervisors who are knowledgeable with regard to all aspects of the contracted treatment and who are responsive to the guidance of Company Foresters. Each supervisor must be able to effectively communicate with the public. They must also effectively supervise contractor crews in order to insure the satisfactory completion of the treatment operation. **Supervisors of herbicide applications must hold at minimum, a commercial certification license or equivalent, from any state within National Grid service territory and comply with license requirements of the state within which applications are taking place.**

5.3 Training

Contractor shall provide their employees with training that includes, but is not limited to, recognition of electrical hazards, working in proximity to energized facilities, identification of operating voltages, minimum approach distances, and other applicable rules and regulations associated with worker safety.

Additionally, National Grid trains vegetation management contractors annually on the contents of this Specification.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 16 of 36
	Date:	November 1, 2005

5.4 Commencement of Operations

Contractor may not initiate activities without a Purchase Order, with Terms and Conditions attached, from the National Grid Supply Chain Management (SCM) Department. The Terms and Conditions attached to the Purchase Order are incorporated in this VMP. Contractor shall contact Company Transmission Forestry staff if a Purchase Order has not been received by the time right-of-ways are scheduled for treatment. The contractor must return the signed acknowledgment copy of the Purchase Order to the SCM Department before any work is done.

5.5 Permits/Plans/Approvals

Contractor shall follow all conditions of state permits/plans/approvals obtained by the Companies.

5.6 Notifications to National Grid

At least one week prior to the initiation of vegetation management operations on a specific right-of-way, the contractor must specify to Transmission Forestry the date work on that right-of-way will begin.

At least one week prior to the completion of vegetation management operations on a specific right-of-way, the contractor must specify to Transmission Forestry the date work on that right-of-way will end.

The contractor will notify National Grid companies' Forestry staff of the approximate work schedule the contractor's crew will follow for the treatment year. The contractor shall complete treatment on each right-of-way segment with as few work interruptions as possible.

The contractor must supply crew work locations, on a daily basis, by calling the appropriate regional control center (Appendix 2), and/or other location specified by Company Transmission Forestry staff, before the beginning of the workday. The location information must include the right-of-way segment number, the contractor company and foreman name, and the nearest transmission/distribution line structure number.

The contractor must keep Company Transmission Forestry staff informed about crew location, conditions encountered and problems that arise as work progresses.

The contractor must supply completed Right-of-way Daily/Weekly Clearance Reports or contractor time sheet with equivalent information, for all time and materials work as per direction of Company Transmission Forestry staff.

The contractor shall notify and provide copies of any records/reports of any regulatory inspection by federal, state or municipal officials.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 17 of 36
	Date:	November 1, 2005

5.7 Notifications to Customers/Landowners

The Contractor shall make every reasonable effort to notify nearby residents of all vegetation management activities. (See Appendix 3) They shall also notify any property owner where a yard tree requires pruning or removal. The property owner shall also be notified prior to extensive widening or danger tree removal, unless the Company has provided prior notification or otherwise specified by the Transmission Forester.

Certain statutes and regulations in New York, Massachusetts, Vermont, New Hampshire and Rhode Island require notification to residents/occupants of nearby homes/dwellings prior to use of herbicides. **The contractor shall comply with the appropriate state notification statutes and regulations. Documentation of notification shall be maintained by the contractor.**

5.8 Documentation

The Contractor shall provide the following documents:

The contractor must supply supplemental or new information, regarding site conditions that affect current or future treatment operations, such as new construction and sensitive areas and landowner concerns/requirements.

The Contractor shall complete and return a completed copy of the Field Inventory or weekly time sheets (as appropriate for NE or NY), to include the treatment date, the type and amount of herbicide used, any approved changes in site density, treatment method, etc. to the Transmission Forester. Submittal of these treatment records is required for final payment; therefore, prior to final payment, the Company will require receipt of a complete treatment record/inventory.

5.9 Interaction with Public

The Company strives in every way possible to maintain good relations with the property owner and general public. The actions of the Contractor reflect on the Company; therefore, the Contractor shall give diligent consideration to the interests of property owners, tenants, and the general public, whenever involved, and shall carry out the work in such a manner as to cause a minimum inconvenience.

The contractor or his representative will only respond to inquiries regarding what they are doing, where they are treating, and when they are treating. Copies of appropriate plans or permits may be shown as well. Refer all other inquiries to Company Transmission Forestry staff.

Landowner complaints must be forwarded immediately by telephone to Transmission Forestry staff. The contractor must provide the name, address and telephone number of the major people involved, as well as the complaint or question.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 18 of 36
	Date:	November 1, 2005

5.10 Demands that a Treatment Operation Cease

Handle demands that a treatment operation cease as follows:

- Immediately remove all personnel, equipment and materials to another property and continue treatments.
- Notify Company Transmission Forestry staff as soon as practical, if not immediately, of a demand that treatment cease. Upon contacting Transmission Forestry, relate the chain of events and current status of the situation.
- Do not return to that site until Company Transmission Forestry staff notifies the contractor when and under what circumstances the crew may return.

5.11 Access

Enter a site through the right-of-way on established roadways whenever possible. Permission to enter by any other means must be obtained from the landowner by the contractor.

Access to the right-of-way shall be limited to public road crossings. Where this is not possible, the Contractor shall obtain permission for the use of private roads, driveways, and other access to the right-of-way from the property owners involved and shall be responsible for any damage thereto. When permission for off right-of-way access cannot be obtained from the property owners involved, and other ingress/egress is unavailable, the Contractor shall notify the Transmission Forester or their designee.

In general, vehicular traffic shall be restricted to a 20 feet wide roadway, into and along the right-of-way. When present, existing roads into and along the right-of-way shall be used as the primary access, and maintained in as good or better condition for the duration of the Contractor's use. Additionally, primary ingress and egress on Article VII right-of-ways are restricted to designated access routes. Access to the overall right-of-way is allowed only for selective vegetation maintenance with all terrain spray units, skidder buckets for danger tree removal, and similar right-of-way maintenance activities. Other vehicles must remain on the designated access roads. Appropriate efforts to minimize unnecessary or excessive environmental or vegetation damage are required. Repair or replacement of excessive or unnecessary damage shall be the responsibility of the Contractor.

5.12 Site Conditions

Unreasonable site damage or destruction during any phase of the vegetation management operation by the contractor, his agents or employees, must be repaired immediately to the satisfaction of Company Transmission Forestry staff at no cost to National Grid companies. Company Transmission Forestry staff will determine what constitutes unreasonable site damage.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 19 of 36
	Date:	November 1, 2005

The Contractor shall leave all culverts, stream fords, fences, gates, walls and roads in the same or better condition as when they commenced their work. Any trees to be removed that have fence wire attached, or that is part of a permanent, functional fence shall be cut off above the top strand of wire. Care shall be taken that all fences and gates are closed or left in such condition that livestock cannot escape. If fences or gates of an active pasture along the right-of-way are in a state of disrepair prior to the start of clearing and could allow livestock to escape, the contractor shall attempt to notify both the property owner and the Forester of this condition. Where movement of the Contractor's equipment is required through existing fences, the Contractor shall make appropriate openings and adequate facilities for closing these openings during and after their use.

5.13 Herbicides

Application of herbicides by the Contractor shall conform to the following:

The contractor shall utilize only herbicides, mixture rates and solutions prescribed by Transmission Forestry (See Appendix 7). Herbicides, adjuvants, carriers and additives are hereinafter collectively referred to as "materials."

5.13.1 Handling, Mixing, Loading and Labeling Herbicide Concentrates

All containers (tanks, gerry jugs, etc.) containing herbicide mixes shall be labeled with the trade name and concentration of each herbicide in the mix

The majority of the Contractor's handling, mixing, and loading of herbicide concentrates is to be done at the contractor's base location. If it is necessary to handle, mix, or load herbicide concentrates at any other location, the contractor is required to comply with herbicide label directions and existing regulations regarding set backs from sensitive areas and safety precautions.

No handling, mixing, or loading of herbicide concentrates will be done within the buffer zones adjacent to any drinking water supplies or surface waters, nor within 100 feet of any other sensitive area. All water to be used to mix herbicide solutions will be secured from a faucet or open bodies of water, which are not drinking water supplies. If pumps are used they must be equipped with anti-siphoning devices. Pumps and hoses used for water will not be used to pump or mix herbicides.

5.13.2 Treatment Width

All treatment operations must be applied to the full cleared width of the right-of-way. Company Transmission Forestry staff will determine whether the full cleared width of the right-of-way has been treated. The contractor must, at his own expense, re-treat the site upon notification by

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 20 of 36
	Date:	November 1, 2005

Company Transmission Forestry staff that a treatment was not applied to the full cleared right-of-way width. Re-treatment must be accomplished by using the application method and materials prescribed by Transmission Forestry.

The Contractor shall confine their activities within the limits of the right-of-way, except for danger tree removals and authorized off right-of-way access. All right-of-way restrictions noted in the inventory and/or on the drawings shall be strictly adhered to by the Contractor.

5.13.3 Treatment Effectiveness

Treatments must result in 100% control or removal of all target species greater than or equal to six feet in height. The contractor shall also provide a minimum of 95% control or removal of all target species less than six feet in height. Treatment effectiveness extends over the full 5 to 8 year treatment cycle. Any target species identified as a hazard to the line and shown to have been six feet or taller at the time of treatment shall be subject to this provision. Company Transmission Forestry staff will determine whether a treatment has been effective.

The contractor must, at his own expense, re-treat the site(s) upon notification by Company Transmission Forestry staff that a treatment was ineffective. Re-treatment must be accomplished by using the application method and materials prescribed by Transmission Forestry. Exceptions to this treatment effectiveness standard are limited to trees in yards, special road crossings, landowner treatment sites and must be noted in right-of-way Field Inventory.

5.14 Danger Trees

Crews treating the right-of-way floor shall routinely check for Danger Trees adjacent to the right-of-way to assess and identify any Hazard Tree conditions. Hazard Tree conditions, or Danger Tree growth within Minimum Clearance Distance as defined above shall be reported to the Transmission Forester.

5.15 Wetlands and Sensitive Areas

The IVM treatment crew will deploy a cutting crew or point person in advance of the main herbicide application operation to locate and flag the boundaries of these Sensitive Areas and/or the appropriate buffer zones.

5.16 Railroads

Where the Company's right-of-way parallels or crosses railroad property, and the Contractor elects to gain access to the right-of-way from railroad property, they

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 21 of 36
	Date:	November 1, 2005

shall be responsible for all applicable rules, regulations and fees pertaining thereto.

The contractor must:

- Obtain a permit, if required, from the railroad near whose tracks he or she will be treating. Any fee may be billed as a treatment cost.
- Check with each railroad near whose tracks he will be treating, to ensure that the contractor carries all insurance, which the railroad may require. Contact Company Transmission Forestry staff if any problems arise.
- Refrain from beginning a treatment whenever a railroad has failed to provide a flagman or remove the railroad from service. Contact Company Transmission Forestry staff immediately, so that he or she can contact the railroad.

5.17 Native American Lands

The Contractor shall not use herbicides to manage vegetation on Native American reservations without prior, express approval of the Transmission Forester. Where required to complete work upon reservations, the contractor shall employ the designated Native American personnel for the successful completion of the project. The only reservation with a tentative agreement allowing the use of herbicides in New York is the Seneca Reservation in southwest New York.

5.18 Chainsaw bar lubricants

Chainsaw bar lubricants must be biodegradable products. The Forestry Manager will approve specific products.

5.19 Equipment

The contractor crew supervisor or foreman must be equipped with a pager or cellular telephone. The pager or cellular telephone number must be provided to the division control center.

Applicator crews should carry with them at all times a shovel, a broom, heavy-duty plastic bags or other leak proof container, adsorptive clay and activated charcoal.

Contractor's equipment, including backup equipment, must be sufficient to maintain the highest practical level of efficiency and effectiveness. Equipment must be maintained in good visual and working condition.

5.20 Site Restoration

Work shall also include grading, mulching, and reseeded of rutted or scarified soils caused by the Contractor's operations, when directed by the Transmission Forester. This shall include repair of all environmental damage, maintenance of stream crossings, wetlands, crop fields, fence lines, etc. which are adversely

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 22 of 36
	Date:	November 1, 2005

impacted by the Contractor so as to leave the right-of-way in as good or better condition than found.

Inclusion of the repair of any previously existing environmental damage, including grading, seeding mulching, stream, culvert and ditch repair, etc. shall be specified at the time of bidding or completed on a Time and Material basis if required.

6.0 Vegetation Management Practices and Procedures

6.1 Practices and Procedures – Maintenance

6.1.1 Right-of-Way Floor Program

A treatment operation generally includes most of the vegetation management methods described below. Herbicide treatments, employing herbicides and treatment methods consistent with the sensitivity of the site, shall be the preferred method of vegetation management. Three methods of herbicide treatments are utilized: basal application, cut stump application and low volume and high volume foliar applications.

Treatment is generally carried out in two phases: Preparatory Treatment and Foliar Treatment. These two phases may be carried out separately or simultaneously depending on vegetative conditions or permit requirements for each right-of-way segment.

Company Transmission Foresters identify right-of-way segments to be treated each year in the Annual Work Plan. Field inventories of each right-of-way segment to be treated are completed by Company Transmission Foresters and provided to the contractor.

An IVM treatment operation is carried out within a treatment/calendar year. Preparatory treatment is generally completed prior to June 1, so that any vegetation approaching the minimum clearance distance is treated prior to new annual growth. Foliar treatment shall be completed prior to October 1 of each year. Certain sites requiring hand cutting, mowing and/or cut stump treatment may be carried out after October 1.

The contractor shall preparatory treat all vegetation approaching the Minimum Clearance Distance prior to June 1 of a treatment year, to assure reliability of the line.

6.1.1.1 Selective Vegetation Management

The Contractor shall treat all incompatible vegetation listed in Appendix 9, Exhibit A (tall growing trees) within the wire zone and border zone of the right-of-way.

Appendix 1
Summary of Key Specification Requirements

Specification Summary	Specification Page #	NY	MA	RI	NH	VT
Inspection of floor herbicide work carried out the Spring following treatment. This inspection is the responsibility of National Grid.	12	Y	Y	Y	Y	Y
All workers hold "applicator license" or "apprentice"	15	Y	Y	Y	Y	Y
All supervisors hold "category/commercial certification"	15	Y	Y	Y	Y	Y
National Grid voluntary notification to all nearby residents	17	Y	Y	Y	Y	Y
Notification per legal requirements	17	Y: DEC	Y: VMP	N	Y: Ag	Y: PSB & Ag
Herbicide products specified by National Grid.	19	Y	Y	Y	Y	Y
No mixing or handling of concentrates in Sensitive Areas	19	Y	Y	Y	Y	Y
Extent of Work - Performance						
Removal/Treatment of full width of ROW	19	Y	Y	Y	Y	Y
Removal/Treatment of 100% target vegetation greater than 6 feet	20	Y	Y	Y	Y	Y
Removal/Treatment of 95% of target vegetation less than 6 feet	20	Y	Y	Y	Y	Y
Warranty of work over full cycle any vegetation that was 6 feet tall at the time of treatment.	20	Y	Y	Y	Y	Y
End-to-end inspection/mitigation of ROW segment prior to June 1 of IVM treatment year by contractor (included in contractor IVM bid)	22	Y	Y	Y	Y	Y
Modified Border Zone / Wire Zone	22	Y	Y	Y	Y	Y
Wire Zone Target Shrubs/Short Trees: See Appendix 9 Exhibits A and B	23	Y	Y	Y	Y	Y
Hardwoods: Cut and CST over specified height	23	16 feet Hydraulic 12 feet Backpack	12 feet	12 feet	12 feet	12 feet
Hardwoods: Foller spray less than specified height	23	Y	Y	Y	Y	Y
Conifers: Cut over specified height (knee-height)	23	2 feet	2 feet	2 feet	2 feet	2 feet
Conifers: Foller spray less specified height (knee-height)	23	Y	N	Y	Y	Y
Cedars: Cut all over specified height	23	6 feet In WZ 12 feet in BZ	12 feet	12 feet	12 feet	12 feet
Treat/Remove all woody species within 10 feet of structures and guys	23	Y	Y	Y	Y	Y
Treat/Remove all woody species along roads to provide access route 20 feet wide	23	Y	Y	Y	Y	Y
Treat/Remove all vegetation within 5 feet of substation fence line	24	Y	Y	Y	Y	Y
Vegetation Management in Protective Buffers	24	Y: PSC Plan	Y: VMP	Y: MA VMP	Y: Permit	Y: Permit
Herbicide Use in Wetlands	36	Y: DEC Permit	Y: VMP	Y: label	N	Y: Permit

Appendix 2
National Grid Forester and Control Center Contact Information

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 23 of 36
	Date:	November 1, 2005

The contractor shall treat all incompatible vegetation listed in Appendix 9, Exhibit B (small trees) within the mid-span of the wire zone of the right-of-way, except where the mature height would not approach the Minimum Clearance Distance.

Vegetation listed in Appendix 9, Exhibit B will be retained in the border zone of wider right-of-ways.

Small trees shall also be removed from the wire zone and border zone on narrow right-of-ways such as sub-transmission.

Incompatible hardwood vegetation greater than the height specified below shall be hand cut and stump treated. Incompatible hardwood vegetation less than the height specified below shall be foliar or basal treated. A height limit of 12 feet is applicable for low volume backpack foliar treatments. A height limit of 16 feet is applicable for high volume or low volume hydraulic foliar treatments (NY only).

Incompatible conifers (except Cedar species) over 2 feet tall (knee-height) shall be hand cut. Only Pitch Pine shall be stump treated. Conifer species less than 2 feet tall shall be foliar treated (except in Mass).

Cedar species in the border zone over 12 feet tall shall be hand cut. Cedar species in the wire zone over 6 feet tall shall be hand cut (NY only).

6.1.1.2 Non-Selective Vegetation Management

All vines growing on guys, poles and towers shall be treated.

All woody-stemmed species growing within 10 feet of guys, poles and towers shall be cleared and treated, using the treatment technique being applied to the surrounding site. Wherever practicable, grape vines shall be treated with and approved low-volume foliar method.

All trees and shrubs growing within the established or designated access road(s) along the right-of-way shall be treated to provide an access route 20 feet in width. Where there is no established access road, a route shall be designated and/or approved by the Transmission Forester, and the Contractor shall

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 24 of 36
	Date:	November 1, 2005

clear the same. Where multiple improved access roads exist within the right-of-way, the Contractor shall maintain all roads.

Treatments will also extend around the perimeter of any substations (within five feet of fence line) and along short side taps associated with the right-of-way segment.

6.1.1.3 Vegetation Management in Visual Buffers

Where incompatible vegetation listed in Appendix 9, Exhibits A and B, can not be removed, generally trees visual buffers, in yards and road crossing,, said vegetation shall be pruned to the At Time of Vegetation Management clearance distances shown in Section 3.3.1. The specific maintenance technique is specified in the Field Inventory.

6.1.1.4 Vegetation Management in Protective Buffers

The size/dimensions of protective buffers generally specified in state level plans/permits. **Incompatible vegetation in protective buffers is hand cut or mowed as specified in the Field Inventory.**

6.1.2 Right-of-Way Danger Tree Program

Trees adjacent to the right-of-way that have grown to the extent where they could endanger the operating continuity of the line shall be removed, or pruned, as specified in the Field Inventory. They shall be reviewed with the Transmission Forester if not covered by the inventory, so as to obtain the required clearances. When pruning is called for along the edge of the right-of-way and the required clearances cannot be obtained, all branches shall be removed which are overhanging the right-of-way.

Off right-of-way management maintenance methods are limited to danger tree removal via hand cutting and pruning. Removal is the preferred method.

Company Transmission Forestry staff will designate areas in which trees are to be side pruned. Within those areas, use pruning when limbs from trees off the right-of-way pose an immediate or potential threat to the line and removal of the entire tree is not practical or possible.

6.2 Practices and Procedures – New Construction

Initial clearing of new right-of-ways and clearing of additional width along existing right-of-way generally requires significant land clearing activities. Land clearing generally involves the removal of all trees on the right-of-way. Most of the vegetation management techniques discussed below are employed. In

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 25 of 36
	Date:	November 1, 2005

addition, cutting, skidding and chipping of whole trees is generally necessary. In most instances specific job requirements for equipment and degree of clearing are specified in state or federal permits for the construction job.

6.3 Vegetation Management Techniques

6.3.1 Herbicides

6.3.1.1 Basal Application

Apply basal treatments with basal wands. Keep pump pressures at the minimum required to adequately cover the target. When treatments are interrupted by rain, resume the treatment only after the rain ends. Resume treatment at the point where it was interrupted, once it is observed that the lower stem of the target species is predominantly dry.

This method includes the application of an approved herbicide product to the base of the target stem, for a distance of up to 18 inches. This method is utilized within sites of higher environmental, aesthetic or public sensitivity where cut and stump treatment would not be as effective in controlling target species.

Spray Solution. Approved mixtures shall be mixed and applied in strict accordance to manufacturer's label directions. Any additives shall be incorporated as approved by the Forester and in accordance with manufacturer's recommendations.

Equipment. Herbicide solutions shall be applied by either hand operated backpacks, or hydraulic units operating at 25-psi nozzle pressure or less. Nozzles shall be adjusted to provide a coarse stream of large droplets.

Application. All tall growing woody species, including shrub and small tree species that require clearing as described by this specification, and has been designated for basal treatment within the inventories, shall be treated with the approved mixture. When using oil mixtures, each base of the target stem shall be thoroughly wetted to ground line, including all exposed roots, and for a distance of up to 18 inches above ground line. Where sprout growth has originated from a previously cut stump, the entire stump shall be treated to ground line, as well as the basal 18 inches of each sprout. Conventional basal treatments wet the lower 18 inches until run down and puddling at the base of the stem. Low

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 26 of 36
	Date:	November 1, 2005

volume applications require a lighter wetting of the lower bark surface, without run down and puddling.

Season. Basal treatments can be made at any time of the year, except when the base is covered by snow, ice or water.

Weather. Treatment shall be discontinued when snow, ice or water prevents direct contact of the spray solution with the bark, stump and stem to ground line. Plants treated less than one hour before a heavy rain shower shall be retreated. An interval of at least one hour, with adequate drying conditions, shall elapse after a heavy rain ceases before treatment resumes.

6.3.1.2 Stump Application (Cut Surface)

After the stem of the target species is cut, apply herbicide with a squirt bottle or backpack sprayer. When treatments are interrupted by rain, resume the treatment only after the rain ends. Resume treatment at the point where it was interrupted.

This method includes the application of an approved herbicide product to the cut surface and/or stump of a recently cut stem. This method is utilized within sites of higher environmental, aesthetic or public sensitivity.

Spray Solution. An approved ready to use herbicide product or a mixture shall be applied in strict accordance with the manufacturer's label directions. Additives shall only be incorporated in accordance with those directions and as approved by the Transmission Forester.

Equipment. Stump treatment products shall be applied using either small hand applicators, or squirt bottles for products intended for cut surface treatment. Hand operated backpacks may be used for treatments targeted toward the entire stump, at nozzle pressures of 25 psi or less.

Application. All tall growing woody species, including shrub and small tree species that require clearing as described by this specification, and has been designated for stump treatment within the inventories, shall be treated with the approved mixture. When using oil mixtures, each stump shall be thoroughly wetted to ground line, including all exposed roots. Where sprout growth originates from the stump, the entire stump shall be treated to ground line, as well as the basal 18 inches of each sprout. When

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 27 of 36
	Date:	November 1, 2005

mixing and using water-soluble herbicides, including the ready to use products, application shall be made immediately following cutting, to the outer surface. Delays of more than a few minutes will result in air blockage within the stump, and reduced or ineffective treatment. Should this occur, the Contractor shall be held wholly responsible for follow up treatment to provide acceptable control. All personnel shall be diligent to insure treatment of all cut stems.

Season. Normally, stump treatments can be made at any time of the year, dependent upon specific product restrictions. However, stump treatments shall not be made with Accord, Roundup, or Compadre during the dormant season. In addition, treatments shall be restricted during the spring sap flow period.

Weather. Stump treatments with oil base herbicides shall be discontinued when snow, water, or ice prevents direct contact of the herbicide mixture with the bark, stem and exposed roots, down to ground line. Plants treated less than one hour before a heavy rain shower shall be retreated. An interval of at least one hour, with adequate drying conditions, shall elapse after a heavy rain ceases before treatment resumes.

6.3.1.3 Foliar Application

When applying foliar treatments on the edge of the treatment area, (forest edge, site borders) spray herbicide toward the center of the right-of-way in order to prevent off-site drift.

Keep pump pressures at the minimum required to adequately cover the target. When herbicide treatments are interrupted by rain, resume the treatment only after the rain ends. Resume treatments after active leaf runoff has ended and then re-treat those portions of the site that were treated approximately four hours before the rain started.

Do not apply foliar treatments during windy periods when spray material has a high propensity to drift or if standing water is present under the target plant during treatment.

High Volume and Low Volume Hydraulic Application

This method includes treatments of water borne herbicide mixtures, using hydraulic spray tanks, mounted on all terrain units such as pickup trucks, skidders, tracked units, etc.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 28 of 36
	Date:	November 1, 2005

Spray Solution. Approved herbicides shall be tank mixed in strict accordance with the manufacture's label directions. Approved surfactants and a drift control additive that is compatible with the label shall be added to the spray mixture. Additional additives shall be reviewed with and approved by the Transmission Forester prior to inclusion in the tank mixture.

Equipment. The spray tank shall be equipped with an agitator and the herbicide solution shall be thoroughly mixed before application is begun. An orchard type spray gun shall be used to apply the mixture. The preferred selective foliar method shall be the low volume hydraulic rate, as compared to conventional high volume treatments. High volume hydraulic applications shall generally be limited to higher density sites requiring more non-selective treatment. The nozzle pressure shall not exceed 50 psi for the low volume hydraulic technique, versus 100 psi for conventional high volume applications. Each foliar operation shall utilize a "clean" water re-supply truck, which neither transports nor directly mixes herbicides on the unit.

Application. All tall growing, woody plant species, including but not limited to those listed in Exhibit A, B or C shall be wetted so as to provide complete control. High volume treatments shall wet both the leaves and stems to the point of runoff. Low volume hydraulic applications require a through, but light wetting of the leaf surface, without wetting to runoff. The low volume hydraulic method further minimizes damage to desirable under story species. The applicator shall be within 10 feet of the target stems to further minimize non-target coverage and reduce the gallons per acre of active ingredient to the right-of-way. The spray gun setting shall be varied from a coarse droplet to a semi-solid stream to achieve complete coverage while minimizing drift and off site injury or damage.

Season. Selective foliar treatments shall be accomplished during the period between full leaf development and hardening off. In most areas, this corresponds to the period from mid June through mid to late September. Selective foliar applications may be extended into early October using approved low-volume Accord/Arsenal or Krenite/Arsenal mixtures. The Transmission Forester will determine start and cut off dates dependent upon specific site conditions.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 29 of 36
	Date:	November 1, 2005

Weather. No treatments shall be done when the vegetation is wet from a heavy rainstorm or dew. That portion of the right-of-way that was treated within one hour of a heavy rainstorm shall be retreated. At least one hour shall lapse following a heavy rain before foliar treatments are resumed, provided the vegetation conditions are drying and the immediate threat of continued rain has passed. Treatments shall be discontinued when windy conditions could result in off target spray drift (approximately 10 mph).

To prevent excessive damage to desirable species, consideration shall be given to low volume, backpack treatment, or cut and stump treatment of scattered undesirable stems growing within dense communities of desirable species.

Low Volume Backpack Applications

This method includes light and very light applications of more concentrated herbicide mixtures, using hand operated backpacks, to selectively deliver the herbicide mixture to the target plants.

This method is especially preferred for its highly selective control in areas that are suitable for foliar treatments, but not accessible to or appropriate for treatment with hydraulic units.

Spray Solution. Low volume and ultra low volume treatments utilize more concentrated applications of approved herbicides. These products shall be tank mixed in strict accordance with the manufacture's label directions. Approved surfactants shall be added to the spray mixture to optimize coverage and maximize effectiveness. Additional herbicides and additives shall be reviewed with and approved by the Transmission Forester prior to inclusion in the tank mixture.

Equipment. Treatment personnel shall utilize hand-operated backpacks. Nozzle pressures for hand units are limited by the backpack and the applicator, but are generally in the range of 25 psi or less. Water re-supply shall be provided by a "clean" unit that neither transports nor mixes herbicides.

Application. All tall growing, woody plant species, including but not limited to those listed in Exhibit A, B or C (see Appendix 9) shall be very lightly wetted so as to provide complete control. The Contractor shall assure that their treatment personnel are thoroughly trained in the proper application methods and

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 30 of 36
	Date:	November 1, 2005

techniques. The applicator shall be as close to the target plant as possible, but not more than 10 feet from the target stems to further maximize coverage, minimize over spray and non-target damage, and reduce the gallons per acre of active ingredient applied to the right-of-way. The spray gun setting shall be varied from a coarse droplet to a semi-solid stream to achieve complete coverage while minimizing drift and off site injury or damage.

Season. Low volume backpack treatments shall be accomplished during the period between full leaf development and hardening off. In most areas, this corresponds to the period from mid June through mid to late September. Low volume backpack applications may be extended into early October, using approved Accord/Arsenal or Krenite/Arsenal tank mixtures. The Transmission Forester will determine start and cut off dates dependent upon specific site conditions.

Weather. No treatments shall be done when the vegetation is wet from a heavy rainstorm or dew. That portion of the right-of-way that was treated within one hour of a heavy rainstorm shall be retreated. At least one hour shall lapse following a heavy rain before foliar treatments are resumed, provided the vegetation conditions are drying and the immediate threat of continued rain has passed. Treatments shall be discontinued when windy conditions could result in off target spray drift.

To minimize the risk of over spray to sensitive non-target plants, the Contractor shall consider and discuss the possible use of cut and stump treatment methods with the Forester.

6.3.2 Mechanical

6.3.2.1 Hand Cutting

Hand cutting is generally the method of choice where herbicides cannot be applied, or where incompatible vegetation exceeds certain specified heights see Section 6.1.

Cut stems parallel to slope, as close to the ground as practical. Do not leave stumps that exceed three inches in height.

6.3.2.2 Mowing

Use extreme care in order to provide for the safety of workers and the general public. Provide a buffer to shield operations that are carried out close to residences or high public use areas, and/or

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 31 of 36
	Date:	November 1, 2005

employ a knowledgeable person to act as a guard. Cut stumps as close to the ground as practical, making sure that stumps do not exceed three inches in height unless otherwise directed by National Grid Forestry staff.

6.3.2.3 Selective Mowing

Selective mowing shall mean mowing small areas of high density target species, such as extensive Sumac, Buckthorn or Multi-flora Rose, particularly in wire zone mid-spans, or dense woody vegetation encroaching upon roadways or trails to structures.

6.3.2.4 Pruning

Pruning may be required in order to achieve At Time of Vegetation Management clearances between the line conductors and vegetation.

- At designated road crossings, or designated portions of lines along high use public roads.
- Along the edge of the cleared right-of-way where, in order to obtain conductor clearances specified in Section 3.1.1, side pruning or removal of danger trees is required. The pruning and/or removal of danger trees located beyond the limits of the right-of-way is specified on the Field Inventory.
- On designated portions of lines passing through natural preserves, or public or private parks.
- On designated portions of lines passing over ridges or other exposed views of the right-of-way in areas of high aesthetic value.
- In general, along all or part of the route of the line when removal of vegetation is to be minimized consistent with reliable line operation.

Pruning shall be carried out in accordance with the A.N.S.I. A-300 standard.

6.4 Management of Wood and Brush (Slash)

Wood and brush slash may be generated during vegetation management activities. In general, where tree removal or pruning, or mechanized clearing is required, the brush that has been cut (diced) may be left where it falls after being cut so as to lie close to the ground. Length of diced stems or branches should not exceed 10 feet, height of diced slash should not exceed 2 feet.

Near public or private roads, residential or commercial yards, parks, streams, on access roads, or in any sensitive areas indicated on the field inventory, the brush

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 32 of 36
	Date:	November 1, 2005

shall be disposed of by either chipping or removal to a suitable location within the right-of-way and neatly piled, windrowed or dispersed. The site-specific slash disposal method is identified in the Field Inventory.

When chipping is required, the chips may be disposed of by dispersing on site in less sensitive areas. Chips shall be removed in areas of more intense landscape management, such as lawns.

Where trees and limbs larger than 4 inches in diameter at the small end are removed, and the designated slash disposal is windrow, the wood shall be neatly piled on the site, taking care not to block any access roads used by either the property owner or the Company. When the authorized slash disposal method is chipping, it may be necessary to remove the larger wood from the site to another approved area of the right-of-way and piled neatly, or moved to an approved off right-of-way disposal site.

No burning of wood or brush will be permitted unless specifically authorized by the Company Transmission Forester.

All species of wild cherry (*Prunus scrotina*, *P. virginiana*, *P. pennsylvanica*) that are cut or treated during the growing season can become toxic to livestock during the wilting stage of the leaves. In addition, several species of Maple (*Acer*) have been identified as toxic to horses in the wilting stage as well. Therefore, Maple and Cherry stems, which are cut or treated in active pastures, shall be immediately removed from the pasture following clearing, or arrangements made with the farmer to utilize alternate pastures until the wilting stage and hazard has passed.

6.5 Mitigation of Impacts

If, during their operations, the Contractor causes any damage to occur to the land such as deep cuts, ruts or scarified areas, which in the opinion of the Transmission Forester could cause future erosion or interfere with access for line maintenance, the Contractor shall re-grade the site to original contours, and seed and mulch as required. Areas that do become rutted or where erosion occurs during sideline program operations will be restored per National Grid companies' policies.

The Contractor shall take reasonable precautions not to remove or damage existing low growing vegetation, either natural or planted, which are to be preserved on the right-of-way. Where road crossing buffer vegetation, either natural or planted, has been damaged beyond reasonable repair because of the Contractor's negligence, this vegetation will be replaced at the Contractor's expense.

The Contractor shall take care not to rut or scarify the right-of-way for the duration of their operation. All environmental damage resulting from the

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 33 of 36
	Date:	November 1, 2005

Contractor's operation shall be permanently repaired at the Contractor's sole expense.

Mobile equipment shall not intrude into road crossing buffers, stream buffer zones or pruning and topping areas, except on designated access routes. When a tree that has been cut must be removed from such an area, it will first be limbed and the brush hand carried to the chipping location or pile site. The trunk wood may be removed by means of a winch line taking adequate care to avoid damaging residual vegetation.

In certain areas, where feasible and advantageous, the Forester may authorize the use of aerial lifts and other specialized equipment, in road crossing buffers for the purpose of pruning trees, and disposal. In no case, however, will any vegetation be cleared or any new road be authorized, other than the approved access road through the screen to facilitate the use of this equipment.

The Contractor shall take adequate precautions to protect the watercourses and wetlands from pollution and shall avoid disturbing streambeds and banks and the low growing vegetation protecting them. Vegetation that is cut shall not be felled into or across streams or ponds. Brush chipping shall be performed in such a manner that the chipped material shall not enter any watercourse or wetland area, nor accumulate in excess of four inches in depth at any location. All logs cut in floodplain areas shall be removed to high ground at the edge of the right-of-way.

7.0 Work Precautions

7.1 Safety

As a contractual term, National Grid requires all contractors to comply with all appropriate state and federal safety laws and regulations. This includes applicable sections of the Occupational Safety and Health Act (OSHA) and all worker safety related statements and instructions on the herbicide label.

It shall be understood and agreed to by the Contractor that herbicide application, hand cutting, pruning and clearing near existing transmission and distribution lines shall be undertaken while lines are presumed to be energized and operating at voltages up to and including 345 kV AC and 450 kV DC. The Contractor shall provide competent, trained, personnel to complete the work.

In order to insure the safety of their employees, the general public and continuity of service in the energized lines, the Contractor shall exercise extraordinary precautions in removing trees and tree limbs that are in such close proximity to the conductors as to constitute a hazard. Such trees shall either be pruned, removed with the aid of ropes, or taken down one section at a time.

National Grid has documented its safety requirements for contractors in the Contractor Safety Requirements, see Appendix 5.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 34 of 36
	Date:	November 1, 2005

In addition, all vegetation management work shall be carried out in compliance with A.N.S.I. Z133.1, American National Standard for Arboricultural Operations – Safety Requirements..

7.2 Sensitive Areas

Sensitive Areas are defined as areas on right-of-way where legal, visual or environmental impacts/concerns require compromises to the general IVM program policy. Sensitive Areas include Public Surface, Public Well and Private Well Drinking Water Supplies; Lakes, Ponds, Rivers, Streams, and any other surface waters; Wetlands; Endangered Species sites; Agricultural areas including croplands, orchards, tree plantations and animal pastures; Buffers at road crossings; Buffers at residential and or commercial yards; and easement restrictions and/or landowner agreements.

These Sensitive Areas have varying legal definitions in each of the states in which National Grid companies have transmission and distribution facilities. Permits for IVM activities in these states vary as well. For purposes of this document Sensitive Areas and vegetation management within them, are discussed in a general way.

In some Sensitive Areas use of herbicides may not be allowed including in Wetlands; Endangered Species sites; Agricultural Areas including croplands, orchards, tree plantations and animal pastures. Hand cutting and limited herbicide applications are generally used in these areas.

The IVM treatment crew will deploy a cutting crew or point person in advance of the main herbicide application operation to locate and flag the boundaries of these Sensitive Areas and/or the appropriate buffer zones.

7.3 Visual and Protective Buffers

Visually and environmentally sensitive sites must be buffered and treated according to procedures and specifications set forth in Sections 6.1.1.3 and 6.1.1.4.

Visual buffers, consisting of trees and/or shrubs, screen the general public from potentially objectionable views of structures and substations. They may be maintained at Road Crossings, Recreational Areas, Residential or Commercial Yards. Specific dimensions for visual buffers may be set by State regulations and/or permit conditions and/or National Grid company policy.

Use shrub buffers on most road crossings or on vantage points where a visual screen is determined to be desirable. Utilize tree/shrub buffers only when legally required or where sites are extremely sensitive visually and shrub growth is inadequate for screening.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 35 of 36
	Date:	November 1, 2005

Protective buffers are established to protect a sensitive area from herbicide deposition. In most instances no herbicides can be applied within these Protective Buffers. Hand cutting or mowing is the primary vegetation management method used in these buffers.

7.4 Weather

Herbicide application will be restricted during certain adverse weather conditions, such as rain, wind or deep snow.

Herbicide applications will not be made during periods of moderate or heavy rain fall.

Foliar applications are effective in light mist situations, however, any measurable rainfall that creates leaf runoff will wash the herbicide off the target. If foliar applications are interrupted by unexpected rainfall, the treatment will not resume until the rain ends and active leaf runoff has ceased.

Basal applications are ineffective during measurable rainfall. Basal applications that are interrupted by rainfall will not be resumed until at least fifty percent of the application zone of the target species is dry.

Excessive wind can create drift during foliar applications. Significant herbicide drift can cause damage to desirable vegetation on or off the right-of-way. Basal or cut stump treatments are much less affected by wind because they are applied in such close proximity to the ground.

To prevent any significant off-target drift of herbicides, the applicator will comply with the following restrictions:

- a. During periods of wind, which are strong enough to bend the tops of the main stems of tree species on the right-of-way, the contractor crew supervisor will periodically observe the application of the foliar treatment to insure that there is no significant movement of the herbicide solution. If the supervisor can see the solution moving off the target, applications will immediately stop until the wind has subsided enough to permit further applications.
- b. All herbicide solutions to be used for a foliar application will contain low-drift agents. Low-drift agents will be added to the foliar herbicide solution as per the low-drift agent label. In moderate wind conditions, as per label recommendations, more low-drift may be added, at the discretion of the contractor supervisor, to control significant drift.

National Grid Companies	Revision No.	4
Specification for Right-of-Way Vegetation Management	Page No.	Page 36 of 36
	Date:	November 1, 2005

- c. Foliar treatments will not be applied to target vegetation that exceeds approximately twelve feet or sixteen feet in height as appropriate for low volume backpack or hydraulic applications.

Herbicides will not be applied when the snow exceeds an average depth of six inches on the right-of-way. Deep snow creates logistical impediments for basal and cut stump treatments. Deep snow renders it impractical to basally apply herbicides to the lower six inches of the stem of the target species or to cut target species so that the stumps are below the acceptable maximum height limit because the application zones are buried in snow.

7.5 Wetlands

IVM methods using herbicides on right-of-ways in wetlands have come to be accepted in several states. Tall growing trees generally only occur in wooded swamps, areas that are dry for long enough periods each year to support tree growth. Emergent wetlands including; wet meadows, cattail swamps, shrub swamps and bogs, generally do not support tree growth and therefore do not require management of vegetation. Occasional high ground or hummocks within emergent wetlands may support tree growth and are hand cut. In addition, herbicide use within wetlands is always limited by the presence of surface water including; lakes, ponds, rivers, streams, seasonal ponds and streams and flood storage following heavy rainfall. These buffer zones clearly prevent use of herbicides within or in close proximity to surface water.

Herbicide use in wetlands therefore is generally limited to wooded swamps where no standing water is present. State regulations and permits specify restrictions on herbicide use.

Contact	Location	Telephone Number
NE Control Centers	Westborough, MA	(800) 423-6029
	Providence, RI	(401) 784-7596
NY Control Centers:	West	(716) 831-7225 (6 or 7)
	Central	(315) 460-2395
	East	(518) 356-6471
Transmission Call-In	System	(508) 421-7452
Teri A. Crossley	Albany, NY	(518) 433-5902
John P. Cookson	Westborough, MA	(508) 389-4136
Kenneth Kirkman	Syracuse, NY	(315) 428-5273
Michael V. Sikora	Westborough, MA	(508) 389-9087
Thomas E. Sullivan	Westborough, MA	(508) 389-9086
One-Call	System	(866) 322-5594

Appendix 3
Notification Materials



Important Information for Homeowners along Transmission Rights-of-Way

Our Vegetation Management Department will soon carry out routine maintenance on the electricity transmission right-of-way on or adjacent to your property. A variety of Integrated Vegetation Management (IVM) methods will be used, including hand cutting, mowing, and selective herbicide application, and will be implemented by our licensed and experienced contractors.

IVM is essential to provide safe and reliable delivery of electricity. It prevents tall-growing vegetation from growing into the overhead lines. In addition, we manage vegetation to allow access to the lines for routine maintenance and for restoration of electric service following major storms.

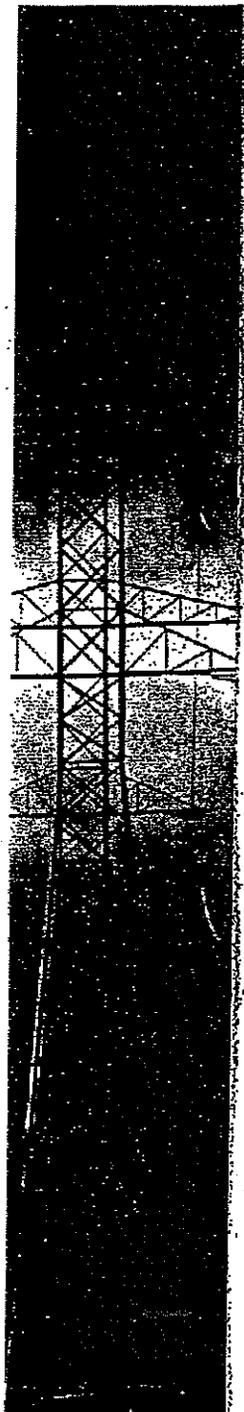
By implementing IVM methods, we create stable, low-growing plant communities that require minimal maintenance and disruption of the environment. These plant communities provide a healthy wildlife habitat, especially for those animals requiring open fields, meadows, and shrubs.

Use of herbicides within our IVM approach is regulated by federal and state statutes and regulations. These requirements protect sensitive areas such as:

- surface water supplies
- wetlands
- public and private wells
- visually sensitive sites near roads and residences

The work takes place in up to four phases:

- Crews hand cut all hardwood and conifer trees within the right-of-way, and identify and mark appropriate buffers surrounding public water supplies, private wells, streams, ponds, lakes, and residences.
- Crews treat the stumps of cut hardwood trees with herbicide to prevent re-sprouting.
- Selective foliar (leaf) application of herbicides, primarily to hardwood trees, takes place in summer.
- Follow-up work at roads and yards is carried out in autumn.



If you have a private water supply well that is within 100 feet of the right-of-way, please call the contractor designated below.

The contractor doing the work in your area is:

The contractor's representative is:

and may be contacted at:

The electric company identification for the right-of-way is:

We at National Grid believe our IVM approach to right-of-way vegetation management is the most environmentally friendly and customer-friendly way to accomplish this necessary task. We would be happy to answer any questions you may have as



Important Information for Homeowners along Transmission Rights-of-Way

Our Vegetation Management Department will soon carry out selective side trimming and/or "danger tree" removal along the electric transmission right-of-way on or adjacent to your property. Our goal is to ensure safe and reliable delivery of electricity. The work will be completed by licensed and experienced contract tree crews.

Side trimming procedures consist of tree crown reduction and/or selective trimming of branches from trees growing along the right-of-way corridor posing an immediate or potential threat to the lines. In such cases, trimming is performed by removing treetops and upper limbs to produce a "rolled back" effect, directing tree growth away from the line.

Danger trees are defined as trees that due to their species, location and physical condition pose a significant risk of contacting the lines. When danger tree removal occurs, a tree (or trees) growing within or beyond the width of the right-of-way are completely removed. While we aim to selectively trim rather than remove trees, removal may be necessary when a danger tree poses a direct threat.

As the work is carried out, crews attempt to reduce visual impacts as much as possible. Cut tree branches are diced close to the ground and left to decompose. Stumps are left as low as possible. Logs are cut and piled along the right-of-way edge following danger tree removal. As a result, aesthetic quality is maintained to the greatest extent possible.

In instances where trees off the right-of-way corridor need to be removed, our contractors will contact the property owner prior to carrying out the work.



The contractor doing the work in your area is:

The contractor's representative is:

and may be contacted at:

The electric company identification for the right-of-way is:

If this box is checked, our contractor has determined that we need to discuss side trimming and/or danger tree removal on your property. Please contact the person listed above.

Appendix 4
National Grid Environmental Policy

National Grid USA

Environmental Policy

National Grid USA is committed to the protection and enhancement of the environment, always seeking new ways to minimize the environmental impacts of our past, present and future activities. We believe that everyone is responsible for good environmental performance as we incorporate environmental considerations into all our business activities. The following principles provide the framework to help us set goals to promote continual improvements in environmental performance and to deliver and maintain a culture that achieves the performance to which we aspire.

We:

- ◆ Expect management to provide visible leadership that promotes good environmental performance and to commit the appropriate resources to achieve our environmental goals;
- ◆ Meet, and where appropriate, exceed the requirements of environmental legislation, policies, charters and other commitments to which we subscribe;
- ◆ Prevent pollution, including the releases of oil and hazardous materials, wherever we can, but if an incident occurs respond effectively to minimize impact on human health and the environment;
- ◆ Minimize and properly manage the waste we generate, and reuse or recycle waste materials whenever economically feasible;
- ◆ Help protect the environment for future generations by making our contribution to minimizing climate change;
- ◆ Monitor electric and magnetic fields (EMF) research developments and assess continually the implications for the way in which we operate;
- ◆ Manage the risks associated with sites that have been contaminated from our past operations and improve these sites where appropriate;
- ◆ Protect and improve, where we can, the environmental status of the land on which we operate;
- ◆ Require our contractors to demonstrate the same level of commitment as National Grid USA in the management of the environment;
- ◆ Ensure that our employees have the skills, knowledge, and resources necessary to contribute to our environmental commitments;
- ◆ Encourage open and constructive dialogue with employees, members of the public and other stakeholders to continually challenge our performance;
- ◆ Identify and manage risks associated with our activities and deliver any improvements through effective environmental management systems;
- ◆ Monitor our environmental performance, audit the effectiveness of our management systems, and report our performance to employees, shareholders, the public and other stakeholders.

Appendix 5
National Grid Contractor Safety Requirements

NATIONAL GRID USA

Highlights of Contractor Safety Requirements T & D Vegetation Management Contractors

This Contractor safety Requirements outline is being provided to assist vegetation management contractors with understanding the safety procedures and programs that will be an integral part of future business and working relationships between National Grid and our vegetation management contractors. Item B "Bidder Information Request Form" will be completed during the pre-qualification process for vegetation management contractors.

In addition to completing the Bidder Information Request Form, contractors should submit their written safety management programs during the pre-qualification phase. We recognize that there will be differences between contractor safety programs, with each program tailored to meet the needs of individual companies. We do, however, expect that the detailed operational safety program components in Item F "Periodic Safety Meetings" will be incorporated in contractor safety management programs in some form.

Contracted Services Procedure

This document outlines the procedures and chain of events which will be followed for Contractors bidding work at National Grid USA. This procedure is outlined below.

Items A-C are completed during procurement process:

A. Initial Safety and Risk Assessment

Contractors will be provided with a list of Risks and Associated hazards identified by the Company which pertain to the job duties they perform. The contractor will be responsible for providing the Mitigation steps that their company will use to minimize or eliminate the hazards.

B. Bidder Information Request Form

Contractors will be required to submit the Bidder Information Request Form which is a multi-page document outlining the Contractor Company commercial, safety and environmental information and programs.

C. Bid Proposal and Evaluation

The User (in this case System Forestry or C&MS) along with Procurement, Safety and Environmental will evaluate the Bidder Information Request form and determine if the Contractor is qualified to bid. Actual bid will be submitted at this time.

Items D and E are completed after contractor is selected:

D. Project Safety Plan

This is a written document detailing the measures taken to reduce the risk of injury, illness, system interruption, property damage and compliance with safety rules. (This may be the company safety handbook or company policies document.) This document is provided prior to starting the work.

E. Pre-Construction Meeting / Contractor Orientation

A meeting with the Contractor prior to commencement of work outlining the safety procedures and scope of the project.

Item F procedures are on-going through the contract period:

F. Periodic Safety Meetings

These will consist of Job Safety briefs, Incident Reporting and Analysis as well as involvement in Safety Observation Tours.

- Safety Meetings include participation in the Forestry contractor executive safety council (likely to occur on a quarterly basis).
- Contractor Safety Meetings may include annual meetings, monthly or weekly "tailboard" safety meetings.
- Job Safety Briefs are the daily documented pre-job safety briefs held in the field.
- Incident Reporting includes reporting of near-miss, hazardous conditions, and incidents involving injury to workers or public to the National Grid One-Call system.
- Incident Analysis includes contractor or National Grid led analysis of incidents. Analysis includes incident details, lessons learned and detailed improvement plans.
- Safety Observation Tours include contractor or National Grid led safety observations tours to observe and improve work practices and behaviors.

Transmission and Distribution Forestry Contractor Safety Requirements

The following is a list of the Safety Items which are in addition to OSHA / ANSI standards that National Grid USA will require our contractors to abide by:

- 1) All applicable requirements detailed in National Grid USA, Safety Procedure, Contractor Safety Requirements, Rev. No. 2. Note that Section 11.1, Flame Retardant Clothing is not applicable for Forestry contractors. Forestry contractors must instead wear natural fiber clothing when working within 10 feet of energized equipment.
- 2) Forestry contractors must wear a properly adjusted full-body fall protection harness connected to an appropriate lanyard when working from an aerial lift. The lanyard must connect to an attachment anchored to either the boom or bucket mounting hardware. Attachment points anchored through only the fiberglass portion of the bucket are not acceptable.
- 3) Forestry contractors will be required to wear chaps while using a chainsaw on the ground.
- 4) Forestry contractors will be required to utilize fiberglass stick and stick saws for work around energized equipment and to test/document their integrity annually.
- 5) Forestry contractors will be required to perform and document dielectric testing of all aerial units annually.
- 6) Forestry contractor management will be required to attend a quarterly executive safety council meeting hosted by National Grid USA. The contractor will ensure that all appropriate safety personnel for the National Grid USA territory are in attendance.
- 7) Forestry contractors shall implement and provide the required training and certification programs necessary to provide OSHA defined Qualified Line Clearance Tree Trimmers or Qualified Line Clearance Tree Trimmer Trainees. For Lump Sum or Unit Price mileage trimming projects a single Foreman may supervise up to four (4) bucket trucks on the same project. However, in that case the minimum qualifications for the "lead" person on each of the other trucks shall be a Journeyman Tree Trimmer or equivalent (Qualified Line Clearance Tree Trimmer). At least one other employee on the truck shall be an OSHA defined, Qualified Line Clearance Tree Trimmer Trainee.
- 8) By April 1st of each year, the contractor shall provide a list of employees that could reasonably be expected to work on National Grid USA property. This listing shall include:
 - identify the current pay classification of each employee
 - the date of their progression to their current pay level,
 - the dates each employee completed each level of the contractor line clearance tree trimmers training program,
 - the dates each employee completed their required OSHA safety and other training, or retraining, including any annual refreshers,
 - the date each employee last demonstrated their tree rescue and climbing proficiency where applicable
 - the date each employee completed CPR and first aid training
 - identify each certified pesticide applicator, their certification number and category certified.
- 9) Forestry contractors must conform to appropriate current industry standards and all future revisions.

Appendix 6
New York Inventory Codes

C. The Transmission Right-of-way Inventory (New York)

1. Inventory Method

The Division Forester shall ensure a detailed, site-by-site inventory is completed for each electric line right-of-way scheduled for regular maintenance either prior to or at the time of actual treatment. Currently, the Division Forester completes the inventories in advance of actual treatment, but in the future, treatment crews may be able to accurately report equivalent field inventory data at the time of treatment, using advanced information technology and handheld geo-referenced systems. Since gas ROWs are generally maintained by mowing, inventories for these ROWs are not necessary.

2. Purpose of the Site-by-site Inventory

A site is an area within the ROW that consists of a common land use pattern or characteristic, or that requires a unique and different treatment method from adjacent areas. Each site may be as large or small as a land use or treatment method requires. The smallest reportable site shall be a tenth of an acre.

The purpose of the inventory is to thoroughly assess site-by-site field conditions, accurately document desirable and undesirable vegetation conditions, insure the assignment of the appropriate prescriptive treatment methods, and record herbicide use requirements. The inventory also identifies special landowner concerns or sensitive site conditions. An example of the right-of-way inventory is included in Appendix 8.

3. Inventory Records

The inventory data is presently collected using handheld data entry systems to record site-specific data. Data collected through the inventory process is then transferred to the master program and summarized for a variety of reports that are used within the maintenance program.

The items documented in the site-by-site inventory include:

- a) Location: The inventory shall describe the site in relation to the adjacent structures, assigning a unique management site number to each site. A management area shall be an area of similar vegetation components that warrant a common management technique.
- b) Land use: The inventory shall identify the right-of-way and/or adjacent land use categories for each site, together with the site sensitivities that influence the management technique that is selected. In the event of multiple uses or sensitivities, the category having the greatest influence on the maintenance

method chosen should be assigned. The special note area can be used to further describe and define sensitivities.

The land use codes have remained unchanged from the beginning of the program, which has allowed for consistent review and performance assessment over the last 23 years. The land use code for a particular site is a combination of numbers assigned to represent the land use activity, height, and density class of undesirables requiring treatment and the density of the retained shrub community.

The land use categories are:

Land use (in the thousands position)

- 1000 - Streams
- 2000 - Wetlands
- 3000 - Road Crossings
- 4000 - Commercial/Industrial
- 5000 - Residential
- 6000 - Active Cropland
- 7000 - Active Pasture
- 8000 - Brush Lands
- 9000 - Woodlands

Height - Undesirable, taller growing species (in the hundreds position)

- 000 - no height
- 100 - small (less than 6 ft.)
- 200 - medium (6 to 12 ft.)
- 300 - tall (over 12 ft.)

Density - Undesirables (in the tens position)

- 00 - no density
- 10 - very light (generally less than 100 stems/acre)
- 20 - light (up to 30% canopy cover, and 100 to 1,500 stems/acre)
- 30 - medium (30 - 65% cover, and 1,500 to 5,000 stems/acre)
- 40 - heavy (greater than 65% cover, and over 5,000 stems/acre)

Density - Compatible shrubs (in the ones position)

- 0 - none
- 1 - light (less than 30% woody shrub canopy)
- 2 - medium (30 - 65% canopy cover)
- 3 - heavy (greater than 65% canopy closure)

- c) Plant community: The inventory shall include identifying and reporting the height and density of up to four predominate undesirable taller growing species, together with the density of the predominate desirable woody shrub species. The following species lists shall be used as a guide to identify

woody tree and shrub species and their compatibility within each site. Within the limits of any easement, property owner concerns, or environmental constraints, the long-term objective should remain the eventual removal of any species capable of invading the wire security zone, while retaining and fostering smaller compatible species already present within the site.

Up to four desirable and undesirable species may be reported for each site.

Appendix 7
Herbicide Mixes

New England - HERBICIDE MIXES - YEAR 2006

<u>Code</u>	<u>Trade Name</u>	<u>EPA #</u>	<u>Percent Active</u>	<u>Mixture</u>	<u>Treatment</u>
B#	Accord C or Glypro/Arsenal	524-343/62719-324/241-346	53.8% Glypho. 28.7% Imazapyr	40% Accord C / 3% Arsenal / 57% Water	Stump
C	Accord C. or Glypro	524-343/62719-324	53.8% Glypho.	40% Accord C / 60% Water	Stump
E#	Garlon 4	62719-40	61.6% Triclopyr	25% in Hi-Grade Oil	Basal
L#	Accord C or Glypro/Arsenal Backpack Low Volume	524-343/62719-324 241-346	53.8% Glypho. 28.7% Imazapyr	3 gals / 1 pt in 100 gals Water (3% Accord C / 0.125% Arsenal)	Selective Foliar (LSF)
R	Krenite/Arsenal Backpack Low Volume	352-395 241-346	41.5% Fosamine 28.7% Imazapyr	5 gals / 1 qts. in 100 gals. Water (5% Krenite / 0.25% Arsenal)	Selective Foliar (LSF)
W	Krenite/Arsenal/Escort Backpack Low Volume	352-395 241-346 352-439	41.5% Fosamine 28.7% Imazapyr 60.0% Metsulfuron	5 gals / 1 qt / 2 oz. in 100 gal's. Water (5% Krenite / 0.25% Arsenal/Escort)	Selective Foliar (LSF)
X	Accord or Glypro/Escort Backpack Low Volume	524-343/62719-324 352-439	53.8% Glypho. 60.0% Metsulfuron	3 gals. / 2 oz. in 100 gals. Water 3% Accord C / Escort	Selective Foliar (LSF)
Z	Test Plots				

NOTES:

Primary herbicide mix.

2006 Soil Sterilant

1 oz Telar / 3 ozs. Oust (Landmark II MP) per 100 gals Water per acre

3 pts Arsenal / 4 ozs. Oust per 100 gals. Water per acre

2.5 lbs. Predict / 3 ozs. Oust per 100 gals. Water per acre #

Note: add Round-up or Glypro - 1 gal. Per 100 gals Water per acre where green vegetation is present

New York - HERBICIDE CODES - YEAR 2006

Code	Trade Name	EPA #	Percent Active	Mixture	Treatment
A#	Pathway	62719-31	5.4% Picloram 20.9% 2,4-D	Premixed, Ready-to-use	Stump
B	Accord C or Glypro/Arsenal	524-343/62719-324/241-346	53.8% Glypho. 28.7% Imazapyr	40% Accord C / 3% Arsenal / 57% Water	Stump
C	Accord C. or Glypro	524-343/62719-324	53.8% Glypho.	40% Accord C / 60% Water	Stump
D	Pathfinder II	62719-176	13.6% Triclopyr	Premixed, Ready-to-use	Basal
E#	Garlon 4/Stalker	62719-40 241-398	61.6% Triclopyr 27.6% Imazapyr	20% / 1% in Hi-Grade Oil	Basal
F#	Tordon K/Garlon 4 Hydraulic High Volume	62719-17 62179-40	24.4% Picloram 61.6% Triclopyr	1 qts./ 2 qts. in 100 gals. Water (0.25% Tordon K / 0.50% Garlon 4)	Selective Foliar (SF)
G#	Tordon K/Garlon 4 Hydraulic Low Volume	62719-17 62719-40	24.4% Picloram 61.6% Triclopyr	2 qts./ 3 qts. in 100 gals. Water (0.5% Tordon K / 0.75% Garlon 4)	Selective Foliar (SF)
N	Accord C or Glypro/Arsenal Hydraulic Low Volume	524-343/62719-324 241-346	53.8% Glypho. 28.7% Imazapyr	4.5 qts./ 1 pt. in 100 gals Water (1.125% Accord C / 0.125% Arsenal)	Selective Foliar (SF)
P	Krenite/Arsenal/Escort Hydraulic Low Volume	352-395 241-346 352-439	41.5% Fosamine 28.7% Imazapyr 60.0% Metsulfuron	2 gals./ 1 qts./ 2 oz. in 100 gals. Water (2% Krenite / 0.25% Arsenal / Escort)	Selective Foliar (SF)
T	Accord C* /Escort Hydraulic Low Volume	524-343/62719-324 241-346	53.8% Glypho. 60.0% Metsulfuron	4.5 qts./ 2 oz. in 100 gals. Water (1.125% Accord C / Escort)	Selective Foliar (SF)
L#	Accord C or Glypro/Arsenal Backpack Low Volume	524-343/62719-324 241-346	53.8% Glypho. 28.7% Imazapyr	3.75 gals./ 1 pt in 100 gals Water (3.75% Accord C / 0.125% Arsenal)	Selective Foliar (LSF)
R	Krenite/Arsenal Backpack Low Volume	352-395 241-346	41.5% Fosamine 28.7% Imazapyr	5 gals./ 1 qts. in 100 gals. Water (5% Krenite / 0.25% Arsenal)	Selective Foliar (LSF)
W	Krenite/Arsenal/Escort Backpack Low Volume	352-395 241-346 352-439	41.5% Fosamine 28.7% Imazapyr 60.0% Metsulfuron	5 gals./ 1 qt./ 4 oz. in 100 gals. Water (5% Krenite / 0.25% Arsenal/Escort)	Selective Foliar (LSF)
X	Accord or Glypro/Escort Backpack Low Volume	524-343/62719-324 352-439	53.8% Glypho. 60.0% Metsulfuron	3.75 gals./ 2 oz. in 100 gals. Water (3.75% Accord C / Escort)	Selective Foliar (LSF)
Z	Test Plots				

NOTES: * Either Glypro or Accord Concentrate may be used in these mixes.
Primary herbicide mix.

2006 Soil Sterilant

1 oz Telar / 3 ozs. Oust (Lanolinmark II MP) per 100 gals Water per acre
3 pts. Arsenal / 4 ozs. Oust per 100 gals. Water per acre
2.5 lbs. Predict / 3 ozs. Oust per 100 gals. Water per acre #
Note: add Round-up or Glypro 1 gal. Per 100 gals. Water per acre where green vegetation is present

Appendix 8
Contractor Audit Form

Transmission and Distribution Right-of-Way Vegetation Management

Contractor Audit Form

Date: _____ ROW Number: _____ Line: _____

Town: _____ State: _____

Forester: _____

Weather: _____

Contractor: _____ Foreman: _____

Number in Crew: _____ Herbicide Licenses: _____

Notification of Customers/Landowners: Y__ N__

Type of Work Performed: _____

Crew has Work Documents: Y__ N__

Understanding of Specification and Work Documents: _____

Follow-up Work Needed: _____

Safety:

PPE: _____
Work Zone Protection: _____
Pre-Job Brief: _____
General Observations: _____

Environmental:

Field Marking of Sensitive Areas: _____
Spill Clean-up Provisions: _____
Containers Properly Marked: _____

Regulatory:

Work Documents: _____
Visits by Officials: _____

Customer/Landowner Concerns: _____

Comments: _____

Appendix 9
Border Zone/Wire Zone Vegetation Lists

EXHIBIT A:

Undesirable Tall Growing Species

The following is a list of tall growing tree species that are considered undesirable in most right-of-way situations and should be removed from the right-of-way floor wherever practicable, to the extent permitted by landowner constraints and easement conditions. The primary objective of the Transmission Right-of-Way Management Program is to effectively remove and control the re-growth and reinvasion of these species.

Ash	ASH	Cucumber Tree	CUC
Mountain	MAS	Elm	ELM
Balsam Fir	BAF	Hemlock	HEM
Basswood	BAS	Hickory	HIC
Beech	BEE	Hophornbeam	HOP
Birch	BIR	Maple	MAP
Cherry		Oak	OAK
Black	BCH	Pine	PIN
Choke	CCH	Poplar/Aspen	POP
Domestic	DCH	Red Mulberry	MUL
Pin (Fire)	PCH	Sassafras	SAS
Black Gum/Tupelo	BGU	Spruce	SPR
Black Locust	BLO	Tamarack/Larch	TAM
Black Walnut	BWA	Tree-of-heaven	THE
Butternut	BUT	Tulip/Yellow Poplar	TUL
Catalpa	CAT	Willow	WIL
Cedar	CED	Other	OTH
Chestnut	CHE		

EXHIBIT B:

Small to Medium Trees

The following is a list of small to medium trees that may be compatible along the edges of the right-of-way, except on narrower sub-transmission rights-of-ways. They should be removed within the wire zone except where the mature height would not invade the Minimum Clearance Distance, or local conditions do not warrant removal. Any plant on the right-of-way that invades the Minimum Clearance Distance may be removed. These smaller tree species may be preferred for retention in buffer areas and other sensitive sites rather than taller growing tree species.

Species	Code
Apple	APP
Buckthorn	BUC
Common Buckthorn	"
European Buckthorn	"
Dogwood	
Alternate Leaf	ADG
Flowering	FDG
Cedars	CED
American Hornbeam	
"Ironwood"	HOR
Hawthorne	HAW
Mountain Maple	MOM
Pear	PER
Shadbush/Serviceberry	SHD
Shrub Willow	WIL
Speckled Alder	ALD
Staghorn Sumac	SUM
Witch Hazel	WIH

EXHIBIT C:

Woody Shrubs

The following is a list of shrub species commonly found on rights-of-way across the service territory. While they are nearly always compatible in the border zone, several may grow tall enough to enter Minimum Clearance Distance.

Species	Code
American Barberry	BAR
Chokeberry	
Black Chokeberry	BCB
Red Chokeberry	RCB
Blueberry	
Low	BLU
Highbush	HBL
Button Bush	BTN
Dewberry	DEW
Dogwood	DOG
Red Osier	"
Stiff (similar to Red Osier)	"
Grey	"
Silky	"
Roundleaf	"
Elderberry	ELD
Hazelnut	HAZ
American Hazelnut	"
Beaked Hazelnut	"
Honeysuckle	HON
Huckleberry	
Juniper	GRJ
Dwarf	"
Ground/Trailing	"
Mountain Holly	MOH
Mountain Laurel	MOL
New Jersey Tea	NJT
Norther Prickly Ash	NPA
Shrub Oak (Bear Oak)	SOK
Privet	PRI
Gooseberry	RIB
Rose	
Domestic	DOR
Multiflora	MUR
Rubus	RUB
Blackberry	"
Raspberry	"

Woody Shrubs (continued)

Species	Code
Silverberry	
American	SIL
Autumn Olive	AUT
Sumac	SUM
Smooth	"
Winged	"
Common Spicebush	SPB
Spiraea	SPI
Sweetfern	"
Steeple Bush	"
Sweetfern	SWF
Viburnum	VIB
Arrowwood	ARR
Highbush Cranberry	HCR
Mapleleaf	MVB
Nannyberry	NAN
Northern Wild Raisin	RAI
Hobblebush	HOB
Winterberry Holly	WIN
American Yew	AMY
Climbing Vines	
Bitterweeet	CLB
Grape	GRA

Note that some of these species can be classified as either exotic or invasive – particularly Autumn and Russian Olive. In addition, some of these species are noxious plants – particularly Multiflora Rose and Poison Sumac. In most situations management objectives within and adjacent to the right-of-way may warrant the removal or reduction of these species. Future discussions with State and Federal agencies to address invasive and exotic species on a landscape scale may require modifications of the current treatment course of action for some species.