In this example, a well-designed and implemented plan can result in healthier, longer-lived plantings which rely less on pesticides and fertilizers, minimize water use, require less maintenance, and increase erosion control. Sustainable landscape design considers the characteristics of the site and soil, intended effect and use of the developed area, in addition to the selection of plants.

It is not the intent of this guidance to supersede federal agency directives, policy, or other guidance which relate to the mission of that agency or to health and safety concerns. It is not intended to supersede agency objectives or guiding principles such as those pertaining to the National Park Service's four primary management zonesnatural, cultural, park development, special use-and their subzones; or those pertaining to the Forest Service's National Hierarchy and Recreation Opportunity Spectrum classification systems. Finally, this guidance does not advocate replacement of existing landscapes, unless it is cost-effective to do so.

Intent of Guiding Principles

The following describes the intent of the implementing guidance and discusses opportunities for federal initiatives. These opportunities are not all-inclusive and federal agencies are encouraged to investigate other initiatives for environmentally and economically beneficial landscaping practices.

1. Use Regionally Native Plants for Landscaping

In the selection of plants for managed federal lands and federally-funded projects, the federal government has the opportunity to choose plants which are aesthetically pleasing, require minimal care, and reflect a "sense of place," i.e. the physical, or symbolic representations of a community or area. By carefully selecting the "right plants for the right place" and matching plant characteristics to site and soil conditions, federal agencies can promote sustainable landscapes. Characteristics of sustainable landscapes include: minimizing water use, reducing the need for pesticides and fertilizers, reducing maintenance costs, utilizing hardy plants, and increasing erosion control. Where the appropriate conditions exist, regionally native plants offer the advantages of natural adaptation to the climatic and geologic environments. In addition, use of regionally native plants can promote regional identity, and enhance wildlife habitat and biodiversity.

2. Design, Use or Promote Construction Practices That Minimize Adverse Effects on the Natural Habitat

Construction practices can adversely affect and alter natural and other habitat. Federal projects can be sited, designed, and constructed to minimize that impact. Federal agencies can incorporate elements of sustainable design into their architectural and engineering plans and specifications for projects planned, designed, and constructed by federal agency or contractor personnel.

Structures can be integrated with the existing plant and animal communities and cultural (human) environments. Considerations include such elements as: ecology of the site; human factors (i.e. historic issues, mission, adjacent land use, and local culture, neighboring communities); water/energy use; pollution prevention and other special issues.

Impact on existing vegetation can be minimized by protecting and integrating plants into the site design. Analyses of the soil and subsurface material are important to the later success of existing and future plantings. These analyses can also indicate the existence of toxic or other undesirable material.

Additional beneficial construction practices which minimize adverse impacts to natural habitat include the proper disposal of construction waste and debris such as paints and other chemicals, concrete, and other building material.

3. Seek to Prevent Pollution

Pollution prevention is a national policy and one of the principles of sustainable landscape management. The primary tenet is: whenever feasible, pollution should be prevented or reduced at the source, and where pollution cannot be prevented, it should be recycled in an environmentally safe manner. Executive Order 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements" was issued to ensure that

* * * all Federal agencies conduct their facility management and acquisition activities so that, to the maximum extent practicable, the quantity of toxic chemicals entering any wastestream, including any releases to the environment, is reduced as expeditiously as possible through source reduction; that waste that is generated is recycled to the maximum extent practicable; and that any wastes remaining are stored, treated or disposed of in a manner protective of public health and the environment * * * 3 In keeping with the executive order and the principles of sustainable landscapes practices, the following initiatives have been identified as having a salutary effect on landscape management.

Manage Pesticides and Fertilizers

The improper use of pesticides and fertilizers contributes to the pollution of both surface and groundwater in the United States. Using effective landscape management practices, and appropriate application of pesticides and fertilizers, federal agencies may minimize that impact on water quality as well as to other aspects of the environment.

Further, federal agencies may better manage soil amendments and fertilizers by utilizing soil and plant tissue samples analyses which can indicate soil deficiencies and nutrient use. The recommended method of managing pests and pesticides is called Integrated Pest Management or IPM as described below.

Use IPM

Through the use of appropriate control measures and proper application, IPM can result in a reduction in the use of chemicals contained in pesticides which may adversely impact human health and the environment. Integrated Pest Management is a decision-making process which considers cultural, mechanical, biological, and chemical controls of pests. Control mechanisms are selected as each situation warrants. Where chemical control is used, specific pest populations are targeted when they are most vulnerable rather than indiscriminate application of these chemicals.

Minimize Runoff

Uncontrolled runoff adversely impacts the environment: (1) As a major contributor to soil erosion; and (2) the primary vehicle for chemical pollutants to be introduced into the environment (particularly non-point source runoff). Federal agencies can ameliorate adverse impacts associated with run-off through a variety of preventative mechanisms: physical; vegetative, and operational. For example, grasses have been demonstrated to be a viable mechanism for minimizing run-off and controlling soil erosion. A viable method of managing the pollutants associated with the first flush of stormwater run-off is bioretention of the storm water in an appropriately landscaped area.

³Executive Order 12856 of August 3, 1993 "Federal Compliance with Right-to-Know Laws and

Pollution Prevention Requirements'', Federal Register Vol. 58, No. 150, Friday, August 6, 1993.