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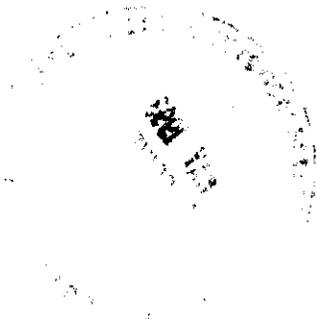
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ARID LANDS ECOLOGY FACILITY
MANAGEMENT PLAN

February 1993

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

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EXECUTIVE SUMMARY

The Arid Lands Ecology (ALE) facility is a 312-sq-km tract of land that lies on the western side of the Hanford Site in southcentral Washington. The U.S. Atomic Energy Commission officially set aside this land area in 1967 to preserve shrub-steppe habitat and vegetation. The ALE facility is managed by Pacific Northwest Laboratory (PNL) for the U.S. Department of Energy (DOE) for ecological research and education purposes. In 1971, the ALE facility was designated the Rattlesnake Hills Research Natural Area (RNA) as a result of an interagency federal cooperative agreement, and remains the largest RNA in Washington. It is also one of the few remaining large tracts of shrub-steppe vegetation in the state retaining a predominant pre-European settlement character.

This management plan provides policy and implementation methods for management of the ALE facilities consistent with both U. S. Department of Energy Headquarters and the Richland Field Office decision (U.S. Congress 1977) to designate and manage ALE lands as an RNA and as a component of the DOE National Environmental Research Park System. Changes to the overall management direction for ALE are not addressed in this document, and would be appropriately addressed in site wide planning documents and related Environmental Impact Statements. Proposals for alternative uses of the ALE facility will be evaluated against this management plan, and if inconsistent would either be disapproved, modified to be consistent, or subjected to further study through appropriate permitting channels and associated NEPA reviews.

Current ALE management policy as provided in the management plan will be instituted through a series of statements, information meetings, and written communications directed toward Hanford Site contractors, external organizations and special interest groups, and the public. The policies and guidelines contained in this plan were developed based on the following management objectives:

- ensuring the availability of adequate research areas where basic and applied ecological research programs can be conducted in support of environmental restoration of the Hanford Site and for other DOE facilities
- maintaining qualified staff for continued characterization and monitoring of natural areas and preserving sensitive habitat and species identified through these efforts
- interacting with other public and private agencies and university research staff to coordinate research and management activities in support of DOE objectives

- participating in educational activities for secondary schools and the general public, and continuing to involve and support undergraduate and graduate students as part of the overall DOE mission
- controlling access to and use of the ALE site to maintain the facility as a research area.

This plan will be updated periodically as either the management situation changes, the environmental restoration mission of the Hanford Site matures and/or the quality of the native shrub-steppe environment changes in response to local, regional, and global influences.

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1.0 INTRODUCTION

The Arid Lands Ecology (ALE) facility, part of the Hanford Site located in southcentral Washington, is a unique area of undisturbed semiarid shrub-steppe. Although the lands currently identified as the ALE facility have been used for ecological research dating back to 1952 (Foster 1952), it was not until 1967 that the Richland office of the Atomic Energy Commission (AEC), a precursor to the U.S. Department of Energy Richland Field Office (DOE-RL) established the ALE Site by administrative order (Vaughan 1977). In 1971, the ALE lands also became the Rattlesnake Hills Research Natural Area (RNA) as a result of an interagency federal cooperative agreement (Vaughan 1977). [Research Natural Area is a classification used by federal land management agencies to designate lands on which various natural features are preserved in an undisturbed state, solely for research and education purposes (Franklin et al. 1972)]. In 1977, the ALE Site was designated by its managing organization at the time, the Energy Research Development Administration (ERDA), as one of four National Environmental Research Park (NERP) sites (Vaughan and Rickard 1977). Currently, the ALE facility retains both its status as an administratively^(a) protected landscape and as an ecological study site as defined by the RNA and NERP designations.

ALE is situated on lands ceded to the United States in the Treaty of 1855 by the Confederated Tribes of the Yakima Indian Nation (YIN). In the treaty, the YIN reserved certain rights including the "privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land." Rattlesnake Mountain which is the main geologic feature of the ALE, is an area of religious significance to local Indian tribes.

Public Law 95-341 (8/11/78), the American Indian Religious Freedom Act states that "henceforth it shall be the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions...including but not limited to access to sites, use and possession of sacred objects and the freedom to worship through ceremonials and traditional rites." This statute does not create additional rights or change existing authorities. It has, however, led federal agencies including the U.S. Department of Energy, to develop policies that managers become informed about Native American religious culture, consult about religious effects of proposed actions, and avoid

(a) Such an administrative designation may be modified or reversed at the discretion of the RL Field Office Manager or higher DOE management elements consistent with sitewide planning commitments and NEPA requirements. Source documentation of the administrative decisions establishing ALE is currently unavailable.

unnecessary interference with traditional religious practices that federal undertakings might affect.

Since its inception, the ALE Site has been managed by Pacific Northwest Laboratory (PNL) for the AEC, ERDA, and more recently for DOE. Currently, day-to-day management of ALE is conducted by PNL for the DOE-RL under Contract DE-AC06-76RLO 1830. The DOE retains final authority over all decisions, policies, and operations regarding ALE Site management.

This management plan includes an ALE management structure, identifies and forecasts facility usage and construction (decommissioning needs), and identifies actions needed by DOE or its contractors to support ALE in the future. The decision to manage ALE lands as an RNA and NERP is not addressed in this document. Redesignation issues are appropriately addressed in the Hanford Remediation Actions (HRA) environmental impact statement (EIS) or other future site-wide EISs or planning efforts. National Environmental Policy Act (NEPA) analysis and documentation will occur for ALE activities requiring this review pursuant to NEPA implementation regulations and policies.

This document contains information on the purpose and need for the ALE management plan (Section 2), the goals and objectives of the plan (Section 3), the policy and procedures necessary for ALE management (Section 4), and provisions for management policy review and management plan revision (Section 5). Appendix A describes field procedures and special safety concerns, Appendix B lists permits that could be required for access and research, Appendix C lists the habitat types found on the RNA and those representing sensitive areas for preservation, and Appendix D describes current plans for decommissioning obsolete ALE facilities.

2.0 PURPOSE AND NEED FOR ALE MANAGEMENT PLAN

The purpose of the ALE management plan is to provide the basis and context for future land use and management practices for the ALE facility. The plan intends to consider national, regional, and local interests; be cognizant of DOE priorities as outlined in the Hanford Strategic Plan; and serve the Hanford environmental restoration mission. Specifically, the plan provides 1) the rationale for managing the ALE facility, 2) input to the Site-Use/Cleanup EIS and the Hanford Remediation Action EIS, and 3) strategies for more effective coordination with the Pacific Northwest Interagency Natural Area Committee to identify and preserve threatened and endangered species and sensitive habitats (Franklin et al. 1972). The plan also serves as a source document for the Hanford integrated planning process and DOE management.

Need for a management plan arises from the fact that, although the ALE facility has been designated as an RNA for over 20 years and as a DOE NERP since 1977, and has functioned as an outdoor laboratory and ecological study site, no formal stewardship policies have been established for managing the site as an RNA.

This ALE management plan provides the framework for interactions of Hanford Site staff involved in research and management activities with outside agencies interested in conducting ecological characterization activities and protecting natural areas. The plan also defines how management staff participates in cooperative studies with universities and coordinates research with other NERPs and other federal agencies managing RNAs, in addition to interacting with federal, state, and private agencies.

Management of the ALE facility may change in the future, depending on the "end-state" selected for the Hanford Site discussed in the Hanford Mission Plan. The Hanford Remediation Action EIS will analyze alternatives and will result in a record of decision that defines the potential future-use categories across the Hanford Site, including on the ALE facility. Until the EIS record of decision is in place, this management plan provides the policy and guidelines for managing the facility as a research natural area, with emphasis on ecological research and education.

2.1 BACKGROUND OF THE ALE SITE

Since 1960, research conducted on ALE has shed light on the climatic, edaphic, and ecological factors that interact in shrub-steppe lands and determine their susceptibility to disturbance. In addition to research, an important role of the ALE facility has been as an outdoor laboratory for students and educators in the natural and earth sciences. Research and

management staff interact with PNL's Science Education Center, PNL's University Programs Office, and the Northwest Organization of Colleges and Universities for the Advancement of Science (NORCUS) to provide opportunities for students and educators to study and observe a large relatively undisturbed shrub-steppe-dominated ecosystem. In early 1992, a MOU (memorandum of understanding) was reached between DOE-RL and the Nature Conservancy that provides for participation by the Nature Conservancy on ALE, as part of the Hanford Site, in identifying and preserving sensitive, threatened and endangered species and their habitats. Past uses of the site are identified in Section 2.2.

2.1.1 Physical Description

The ALE facility is a 312-sq-km area located on the Hanford Site in Benton County, Washington (Figure 2.1). ALE is one of the few remaining sizable, contiguous acreage of shrub-steppe in Washington State that retains a dominant pre-European settlement ecological and physical character. The site lies on the northeast-facing flank of the Rattlesnake Hills and includes the northern side of Rattlesnake Mountain. This feature is a long, anticlinal ridge, with a crest at 1100 m above sea level, dropping steeply (about 25 degrees) to 650 m, then easing down to 350 m, and finally sloping gently into the Cold Creek Valley at an elevation of 150 m (Figure 2.2). Soils on ALE are primarily silt loams on the lower and middle slopes of Rattlesnake Mountain, while steeper slopes consist of stony silt loams, and the basal plains consist of sandy soils (Figure 2.3).

The climate can be characterized as arid, with hot summers and cold winters. Almost two-thirds of the annual precipitation of 10 to 25 cm falls during the winter months. The average annual rainfall increases with elevation, and diverse microclimates result from combinations of slope, exposure, and elevation (Rickard et al. 1988). Shrub-steppe vegetation is characterized by widely distributed shrubs and perennial grasses in addition to a few annual and many perennial herbs. Extensive wildfires in 1957, 1973, 1981, and 1984 removed sagebrush from much of ALE. These areas now support stands of perennial bunchgrasses at the upper elevations, and cheatgrass and bluegrass on the lower elevations, as shown in Figure 2.4.

Two permanent springs are located on ALE: one in Snively Canyon and the other at Rattlesnake Springs. A large number of springs with intermittent or ephemeral stream flow are also scattered across ALE. The two permanent springs support extensive riparian areas in which the major species are black cottonwood, various willows, wild plum, sumac, and mock orange. The riparian areas are narrow corridors along the stream banks, but provide important nesting habitat for a number of bird species.

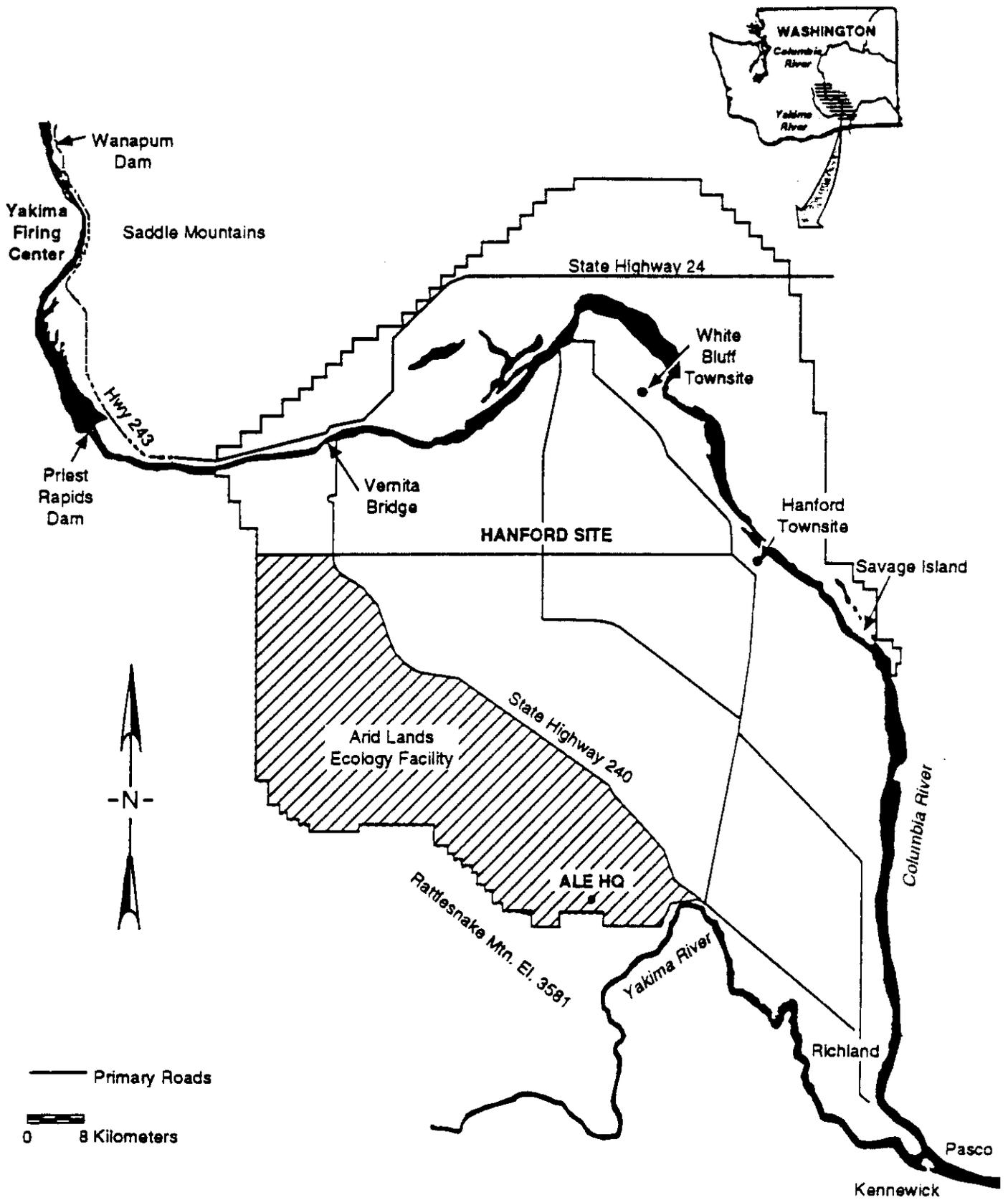


FIGURE 2.1. Location of the Arid Lands Ecology Facility

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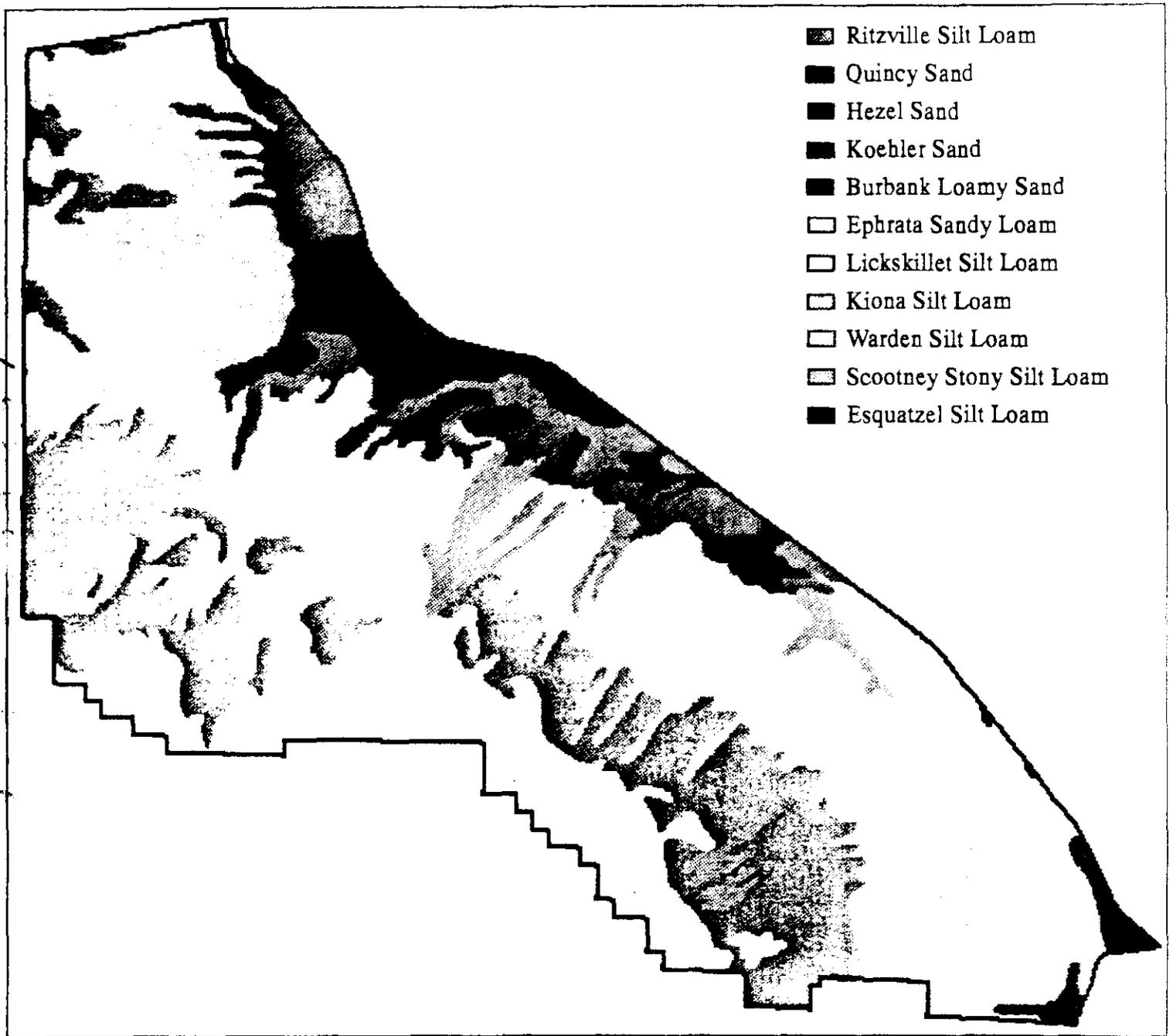


FIGURE 2.3. Map of ALE Soils Classifications (Hajek 1966)

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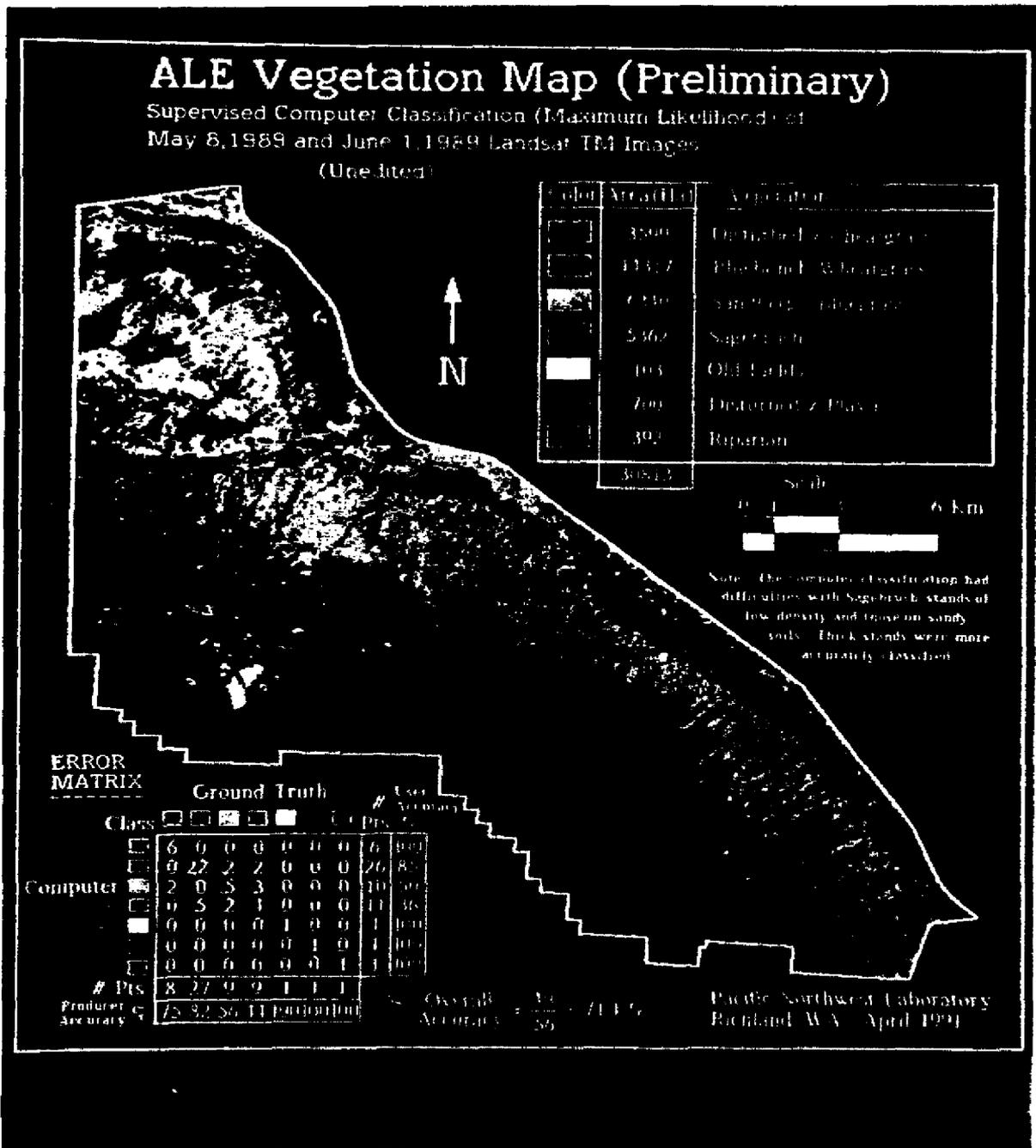


FIGURE 2.4. Map of Vegetation Classifications for ALE. Classifications were made using remote sensing data.

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Two archaeological districts are located on ALE: one at Rattlesnake Springs, which was named to the National Register of Historical Places on 7 July 1976 and one at Snively Canyon, which was named to the National Register of Historical Places on 28 August 1976. To date, 38 historical and prehistorical sites have been found on the ALE site. Because the access to the RNA has been restricted for the past 50 years, the site is archaeologically well preserved.

2.1.2 Facility Description

The ALE complex currently includes laboratories located at the southeastern end of the facility at about 365 m elevation. At ALE headquarters (shown in Figure 2.1), 15 offices and 12 laboratories are housed in four buildings--6652-H, 6652-I, 6652-J, and 6652-M. Building 6652-E is a metal outbuilding used to store large field equipment and as a work place for activities not suitable for a laboratory. A wide variety of ecological investigations, including plant, microbial, invertebrate, and vertebrate studies are conducted within these facilities. Several laboratories and offices in building 6652-J are dedicated for use by the Hanford Cultural Resources Laboratory, which provides archaeological support and expert cultural resources review for DOE. Building 6652-PH functions as a pump house. In addition to these buildings located at ALE headquarters, a field station (metal building) for ecological study is located near the Rattlesnake Springs area.

Immediately north of the ALE headquarters is an underground facility that has served various past uses. Initially it was a missile site, but more recent past uses include operating as an emergency control center for the Hanford Site operations, and housing students who were conducting ecological research on ALE. The facility was refurbished in the mid-1980s for use as an emergency control center for the N Reactor; however, reactor operations were terminated before the facility was placed into operation. An aboveground structure at this site includes a 10-m telemetry tower with associated instrumentation that collect routine wind speed, wind direction, temperature and precipitation data. A second 10-m tower having a similar current use is located on Rattlesnake Ridge. A third 100-m telemetry tower is also located on Rattlesnake Ridge. It is collecting data for use by U. S. Windpower, a private firm planning to develop a network of electrical energy-producing wind turbines along the Rattlesnake Ridge. All three telemetry towers are operated by PNL for DOE.

Other facilities on ALE include the buildings associated with the observatory at the top of Rattlesnake Mountain: building 623A contains the radiotelescope facility, and buildings 6652C/D house the observatory office, a library, and laboratories. Photometers housed at the observatory complex are used to study the aurora. An optical telescope currently being used for tours and public education is within the observatory complex. Four privately owned antenna

stations are also located at the top of the ridge west of the observatory. Proceeding west from the observatory building complex, the private radio towers are operated by Mobile Telephone, Motorola, Columbia Communications, and the Richland Amateur Radio Club.

Also situated on Rattlesnake Mountain is a watershed research facility on the north-facing slope at 300 m elevation. This facility consists of a grid of neutron probe access ports to use in monitoring soil moisture, large monolith weighing lysimeters for accurate measurement of evapotranspiration, runoff plots for collecting additional water balance and erosion data, and a suite of instruments for recording climate data. Because of the excellent capability for monitoring both water balance and climate at the site, several other studies, particularly those in plant ecology, are co-located adjacent to the facility. Data collected at the facility also support research on the use of remote sensing for large-scale evapotranspiration measurement and measurement of Hanford Site groundwater recharge.

No foreseeable requirements for new construction of any facilities on the ALE site have been identified. Decommissioning of unused facilities is discussed in Appendix D.

2.2 PAST USES OF ALE

Pre-settlement uses of the lands now contained within the ALE Site by indigenous peoples are not fully documented, but aspects of land use by Native Americans have been determined by site archaeologists and through contacts with local Native American tribal representatives. Portions of the area served as camp grounds, burial grounds, and sacred sites where religious ceremonies were conducted. Other likely uses by Native Americans of the land included in the ALE Site boundary were grazing of horses, gathering plants for food and medicine, and hunting.

Before 1940, major land uses on ALE were winter sheep grazing, homesteading, natural gas drilling and production, and road building (Hinds and Rogers 1991). Winter sheep grazing was the most prominent use of the land for profit and began in the late 1800s. Land use practices associated with grazing included removing sagebrush and supplementing water supplies with cisterns, irrigation troughs and wells. Vegetation succession in these areas is characterized by non-native plants, primarily cheatgrass. Homesteading occurred on ALE from about 1890 to 1940 in a few areas near reliable water sources and at least two locations (Benson Ranch and Hodges Ranch) where deep wells were drilled. The homesteaders raised sheep, cattle, and hogs, and practiced some dryland farming for feed purposes. Vegetation succession in these areas has depended on the availability of water. Land areas that were irrigated during homesteading now support large populations of Jim Hill mustard, chickweed, and stork's bill in addition to cheatgrass.

In 1913, a well drilled on ALE revealed the presence of natural gas. Full-scale operation of the gas field began in 1929 and ended in 1940. Twenty-four wells were dug with the main gas field located in the southwest quarter of Township 11N, Range 26E. A few relics in the form of foundations, pipes, and assorted trash betray evidence of the natural gas production.

In the 1940s, the current ALE facility was part of the lands acquired by the government for the Hanford Project. From that point in time, the landscape has been subject to relatively few human-induced disturbances except occasional livestock grazing.

2.3 CURRENT RESEARCH AT ALE

The ALE facility continues to be used primarily for basic and applied research activities in support of the Hanford Site. Changes in arid and semiarid landscapes in response to disturbance is of major concern on DOE lands as well as for the nation. Research and monitoring activities on the ALE facility, where scientists can study the shrub-steppe without human-related land-use pressures, provide important baseline data on shrub-steppe ecosystem function. These data serve as an ecological process and habitat model for the environmental restoration of the Hanford Site. The baseline data sets are also important in evaluating climatic trends that may be associated with anthropomorphic activities, in assessing sensitivity of ecosystems to pollutants, and in developing process-based ecosystem models. These data will be used to predict the response of natural systems over local to regional scales to a variety of factors, including global climate change, contamination, and restoration activities.

Other research at ALE supported by DOE's Office of Health and Environmental Research concerns the fundamental mechanisms that control ecosystem functioning. The dynamics of soil nutrients, water, gas flux across interfaces, and energy are being examined to understand how stress influences the efficiency with which an ecosystem processes its essential resources. Quantitative remote sensing techniques have been applied to provide estimates of fundamental ecological properties over landscape-sized areas. Research on sampling methodology ensures an appropriate theoretical basis for new research.

In addition to research and monitoring, the ALE facility serves as an excellent educational resource, one of the major functions of an RNA. Both undergraduate and graduate students are provided with opportunities for study. The ALE outdoor laboratory also serves local elementary and secondary schools, community and civic groups, and the general public.

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3.0 GOALS AND OBJECTIVES

The ALE site will be managed as a national ecological resource to serve the cultural, educational, and scientific needs of the Hanford community, local Native American populations and the nation as a whole. This vision is directly supported by ALE site management goals to 1) preserve a functional unit of shrub-steppe landscape as a part of our national heritage, 2) provide an environmental quality baseline to support the Hanford environmental restoration mission, 3) to promote educational opportunity, and 4) contribute to the fulfillment of major DOE environmental initiatives.

As a part of the Hanford Site, the ALE facility already is managed to support DOE research needs, serving as a control area for Hanford surface water hydrology, ecological function, and wildlife biology studies. As the largest site within the Northwest RNA system, the ALE Site is unique in preserving a large tract of shrub-steppe. In light of the Hanford environmental restoration mission and DOE's continued commitment to science and education, it becomes increasingly important to preserve the ALE site to provide baseline data on ecological response, and to maintain a functional outdoor laboratory for scientists, educators and students. Because of its size, and past protection from human disturbance, the site is also valuable as a source of regional genetic biodiversity.

The strategy for managing the ALE facility to meet these goals is based on the following objectives:

- maintain a quality research facility that provides opportunities for ecological, Native American cultural, and applied research for environmental restoration of the Hanford Site within a large, relatively undisturbed semiarid ecosystem
- maintain qualified staff for continued characterization and monitoring of natural areas
- preserve sensitive habitat and species identified through monitoring efforts
- consult and coordinate with other public and private agencies, university research staff and Native American Tribal representatives on issues relating to Site research and education
- increase support of and involvement in educational activities for elementary and secondary schools, Native Americans, and the general public and continue involving and supporting undergraduate and graduate students
- control access to and use of the ALE site to maintain the facility in a manner that protects the natural ecosystem within the RNA from human disturbance and disruption
- provide access to qualified site users (e.g., scientists, educators and students, and Native Americans involved in religious practice, education, and research) for purposes that are fully consistent with RNA aims and objectives

4.0 IMPLEMENTATION OF THE MANAGEMENT PLAN

The preferred management alternative on which this plan is based is intended to provide more effective management of the ALE facility without departing from the intents and purposes for which the facility was established in 1967. This management alternative provides for preservation of the existing natural features of the RNA. Routine maintenance of buildings, roadways, right-of-ways and research facilities will be conducted and, should facilities expansion or other activities or major capital improvements be planned to support future management of the ALE site, NEPA compliance issues will then be addressed.

This section outlines specific objectives, policies, and implementation procedures that have been developed to support research and education while minimizing disturbance to the RNA. Should specific objectives or policies require change to effectively manage the RNA, then the management plan will be revised as necessary to reflect the required changes.

4.1 MANAGEMENT FUNCTION AND OBJECTIVES

The ALE facility will be managed for the DOE by Pacific Northwest Laboratory, through the Environmental Sciences Department (or successor organization) in the manner that best reflects the spirit and intent of an RNA with primary emphasis on research and education. Familiarity with contemporary national, regional, and local environmental issues and a strong ecological and scientific/educational background are considered to be primary qualifications of the ALE facility manager. Dr. L. E. Rogers, Terrestrial Sciences Section Manager, Environmental Sciences Department, is the current ALE facility manager. Staff from the Environmental Sciences Department may assist Dr. Rogers with management activities as needed. Changes in the ALE facility manager will be made with the approval of the Environmental Sciences Department and the Earth and Environmental Sciences Center management.

The ALE facility manager will use this plan to guide decisions on managing the RNA.

Objectives of the management plan are to:

- provide policy and procedures for application for and conduct of research, education, and communication activities associated with the ALE facility
- provide policy and framework for interaction with other state, federal, and private agencies, local Native Americans and other working groups (e.g., U.S. Environmental Protection Agency, U. S. Fish and Wildlife Service, Nature Conservancy, Pacific Northwest Interagency Natural Area Committee, National Science Foundation Long-Term Ecological Research Site representatives and the Native American tribes)

- provide policy and procedures for routine operation and maintenance of ALE to include fire control, grazing, and site security
- provide policy and guidelines for access to ALE
- provide a mandate for RNA management coordination with affected stockholders including local Native American tribal representatives, research centers, institutions of higher learning, adjacent landowners, and other parties affected by RNA management policy
- document the organizational structure for ALE management.

4.2 MANAGEMENT POLICIES

Based on the goals and objectives described, the following management areas have been identified for the ALE facility and are addressed by specific policy and implementation statements.

4.2.1 Research and Demonstration

The value of ALE as a research area is derived from its size, biological diversity, and ecological quality as a relatively undisturbed natural area. Research conducted on ALE serves local, regional, and national interests in environmental quality and the conduct of basic science.

Policy: Encourage research in ecology, environmental restoration, and Native American historical and cultural land use on the ALE Site to the extent that such study does not disrupt or disturb either the natural habitat on ALE or its ecological function.

Management provisions will be made for the ultimate removal of test facilities and equipment, and the restoration of study sites before authorization of such study.

Implementation: Environmental baseline, ecological, and natural history field studies that require the above qualities are considered appropriate uses of ALE and will be encouraged. Studies or other consumptive uses likely to result in destruction of habitat, loss of biological diversity, reduction in the areal extent of contiguous habitat, or that don't pertain to site ecology or past cultural use of the site will be prohibited. The ALE facility manager will:

- serve as the single point of contact for all proposed research on the ALE facility
- provide to potential ALE facility investigators a list of issues to be addressed in making written application to conduct field research on ALE (Section 4.3)
- interact with local Native American tribal representatives to develop ALE Site opportunities for research on traditional cultural issues by Native Americans for Native Americans

- provide written authorization for the conduct of research
- assure that requirements for including data resulting from such research in the ALE data base are met
- maintain copies of research reports resulting from studies done on ALE
- specify other terms and conditions such as ultimate removal of all field test equipment or plot boundary markers.

4.2.2 Education and Communication

Participation in formal educational (university and pre-university) activities is an important function of the ALE facility and provides opportunities for involving students and teachers at all levels in DOE-related research activities. This activity may include establishing permanent training sites for undergraduate learning experiences. Publishing information about the natural history of the Hanford Site in the public literature is also important and increases community support of Hanford environmental issues.

There also exists a recognized need for Native Americans to practice traditional cultural and religious teaching that involves the passage of information from generation-to-generation, often through tribal elders. In that regard, local Native Americans may also desire access to specific sites such as tribal burial grounds and religious sites or to the site in general to assure the preservation of sites and resources (such as plants or animals valued for food or medicine) that are part of the Native American culture.

Policy: Encourage educational and training opportunities for both students and teachers through established programs at the university and pre-university levels through PNL's Science Education Center and University Programs Office. To the extent possible, ALE will function as an outdoor laboratory for students and teachers from educational institutions. In addition, interact with local Native American tribal entities to develop ALE Site opportunities for traditional cultural education for Native Americans.

Implementation: In addition to the research opportunities described in Section 3.3.1, ALE will be managed to promote education, teacher training, Native American cultural education, and public communication on matters of ecology and the environment. The ALE facility manager, working through the PNL Office of External Relations, which includes the University Programs Office and the Science Education Center, will encourage ALE facility use by students and staff from universities and primary and secondary schools. The ALE facility manager will coordinate through the Science Education Center with local educators for use of ALE for ecology laboratory exercises and field trips. The manager

will further encourage the transfer of information to the general public on the regional ecology, traditional use of the site by Native Americans, and natural history. Examples of public communication include presentations at public forums, articles in the popular press, presentations during approved Hanford open-house events, and participation by ALE technical staff in community school programs. Information on specific locations of graves, religious sites, and other areas of known use of the ALE Site by Native Americans will not be disseminated without expressed written approval of the respective tribe(s).

4.2.3 Ecological Characterization and Monitoring

As part of the Hanford Site, lands within the current ALE boundary have been excluded from public access and protected from most private and commercial uses for the past 50 years. In addition, Hanford operational uses on ALE have been limited historically, and for the past 25 years ALE has been "reserved" for ecological study. As a result, plant and animal species on ALE exist in a relatively natural condition free from many contemporary local disturbances. Thus, monitoring for the abundance, health, and status of natural populations on ALE is becoming increasingly important not only to provide baselines for comparison of environmental restoration at Hanford, but as indicators of ecological change resulting from regional and global processes such as acid rain and global climate change. Effective management of ALE requires knowledge of the status of natural populations as well as sensitive habitats/species. Federal law (Endangered Species Act of 1973) mandates monitoring of species should they become listed as threatened or endangered.

Policy: Conduct monitoring and characterization activities to gain data necessary to effectively manage ALE resources and detect any ecological trends while complying with environmental laws. Coordinate with data from other ongoing research.

Implementation: The ALE facility manager will identify monitoring and characterization needs of sensitive habitats and species and ensure that the resulting data are maintained in available form for purposes of ALE management, environmental restoration of the Hanford Site, evaluation of environmental quality and change resulting from regional and global processes, and demonstrate compliance with existing federal and state environmental regulations. He will consult and coordinate with parties conducting similar monitoring or those entities having an expressed interest in the results of monitoring. Such parties may include local Native American tribes, the Nature Conservancy, the Washington State Department of Wildlife, the U. S. Fish and Wildlife Service, and others.

4.2.4 Habitat and Study Areas Preservation

The natural semiarid landscape on ALE is sensitive to disturbance from anthropomorphic activities. Surface soils and associated plant communities can be damaged by excessive foot trampling or vehicular traffic. Animals are particularly vulnerable during the breeding season, and their behavior is often adversely affected by the mere presence of surface vehicles, low flying aircraft, or persons on foot. In addition, ongoing research can be impacted by damage to the plant communities or behavioral change of animals under study.

Policy: Control access to ALE and activities within the facility to protect sensitive habitat/species and prevent the disturbance of ongoing studies. Vehicular traffic off established roads will not be permitted without authorization of the ALE facility manager, except in the case of an emergency.

Implementation: The ALE facility manager will ensure that maps identifying the locations of sensitive habitats/species and locations of research study sites are maintained and that access to those sensitive sites is restricted. Such controls may include defining the geographical limits of research study areas, posting roads, limiting key access to lockable gates, and seeking the assistance of Hanford Site security in trespass control. The ALE facility manager will be consulted before any planned expansion of operations, and approval will be required for any maintenance or facility siting on ALE. In addition, the ALE facility manager will communicate regularly with Hanford Site operations and maintenance management to ensure that legitimate access by Hanford Site staff for work related to both ALE and Hanford operations and maintenance is conducted in a manner that minimizes negative impacts on the conduct of research and the quality of sensitive habitats, and preserves the well-being of sensitive species. As a result of those communications, the ALE facility manager will maintain a record of the names and telephone numbers of those persons with approved access to ALE, the areas for which access is required, and the general nature of the work being conducted. By the coordinated use of both research area logs and access records for maintenance and operation and by regular communication with both researchers and operations staff, the ALE facility manager will coordinate access and use consistent with the management policies stated above. In addition, the ALE facility manager will coordinate preservation activities with local Native Americans to help ensure the preservation of significant flora and fauna of cultural significance as food and medicine.

4.2.5 Restoration of Disturbed Sites

A number of past and anticipated future disturbances to land areas on the ALE facility may require restoration efforts. Small study sites that have been disturbed, areas where fires have removed vegetation and/or have been severely eroded, roadsides and firebreaks that have been extensively graded, and areas where facilities have been removed may require habitat restoration.

Policy: To return disturbed lands to as near as their original or native condition is the goal for all disturbed sites.

Implementation: The ALE facility manager will have the responsibility for monitoring and evaluating disturbed sites, determining an appropriate restoration action on a site-by-site basis, and implementing the restoration activity. The decision on whether to restore a specific site should be based on the probable effectiveness of natural revegetation/ restoration processes, the potential for successful aided restoration, and available resources. Consultation with outside interest groups, results of research or test plot trials, and other means may be required to reach a decision on individual restoration activities. Improved methods for revegetation and restoration of disturbed sites on the ALE RNA should be encouraged to support of the Hanford environmental mission and to aid in the preservation of cultural resources. Revegetation and restoration methods should be directly transferable to other areas on the Hanford Site and to much of the region's arid and semiarid shrub-steppe landscape.

4.2.6 Domestic Livestock Grazing

Impact to plant communities by domestic livestock, competition with natural herbivores for forage, and associated human disturbances to the landscape caused by the need to provide feed, water, and care for domestic livestock are not compatible with the ALE management objectives (see Section 4.1).

Policy: No grazing of domestic livestock is allowed on ALE except for experimental study.

4.2.7 Fire Management

Fire is a natural occurrence in the shrub-steppe region, and lightning-caused fires occur fairly frequently on ALE. Wildfire causes the temporary loss of vegetation, but most plants and animals are resilient to the impacts of fire and recover rapidly. The ecosystem has evolved in the presence of natural fires.

Policy: Minimize the potential for human-caused fires on ALE by maintaining fire breaks along site boundaries to limit the passage of fires onto or off ALE, and if fires should occur, fighting fires along existing fire breaks, roadways, and near buildings.

Implementation: All fire fighting is the responsibility of the Hanford Site Fire Department. The ALE facility manager will periodically review fire prevention and fire-fighting plans with Hanford Site fire protection personnel, ensuring that facility users take appropriate steps to minimize the possibility of causing a fire and advising facility users of actions that they should take if they encounter a fire while in the field. Procedures for establishing firebreaks and protecting them from wind erosion need to be established.

Prescribed burning is not an element of ALE facility habitat management. Small controlled burns, as an element of research programs, will be considered on a case-by-case basis and will require both the approval of the ALE facility manager and the Hanford Site Fire Department.

Fire protection will be conducted in accordance with the Arid Land Ecology Reserve facility pre-fire plan dated February 1991. The pre-fire plan provides physical descriptions, fire fighting resources, access points and other information useful for fire fighting in six specific zones within the ALE facility. It also identifies areas that are particularly sensitive to disturbance that may be impacted by fire fighting activities. The sensitive areas currently include research study sites. The ALE facility manager will maintain a copy of the facility pre-fire plan and contribute to its revision to help ensure that directives are included in the plan to protect sensitive habitats during fire-fighting.

4.2.8 Site Security

Security needs for ALE are somewhat unique because the site is both large and remote with many tens of kilometers of perimeter fencing. Poaching of wild animals, theft of research equipment installed in the field, destruction of sensitive habitat and of study sites by off-road vehicles and livestock, pillaging of cultural resources, and the increased risk of fires caused by unauthorized visitors are perhaps the most serious trespass and security risks on ALE.

Policy: Control public and contractor access to ALE facility to ensure minimal disturbance to wildlife, vegetation, and ongoing research activities.

Implementation: Maintaining perimeter fencing, posting signs to deter trespassing, persistent care in locking all access gates, and restricting the number of individuals with keys, based on an absolute and justified need, are preventive mechanisms available to

maintain security. The ALE facility manager is responsible for ensuring that signs, fences, and gates are maintained and that authorized users are aware of security procedures and of the need to report the presence of unauthorized vehicles or persons.

If evidence of poaching (taking of wild animals not in accordance with hunting regulations as specified by the state of Washington) is suspected, state police or wildlife enforcement personnel will be informed. The killing of wildlife during legal hunting seasons on the RNA is prohibited by management policy, and will be enforced through DOE trespass restrictions and restrictions on the possession of weapons on Hanford Site property. Hanford Patrol will be contacted initially to deal with trespass and weapons violations.

The noise from low-flying aircraft, specifically helicopters and airplanes flying below the 200-ft Federal Aviation Agency ceiling (regulations for flight over unpopulated areas), is a source of disturbance to fauna on the ALE facility. Such disturbances can cause species to alter migratory patterns, breeding or nesting habits, and grazing or feeding patterns. The ALE Site manager shall request that DOE restrict overflights by all Hanford-related aircraft for specific times and locations over ALE as requested by Native American representatives, scientists, and other facility users whose scientific, educational, or ceremonial use of the facility may be diminished by such overflight. The ALE facility manager should advise users on specific procedures for recording and reporting all sighted aircraft that are low flying or otherwise engaged in unusual flight patterns over ALE.

4.2.9 Population Control

Plant and animal populations undergo fluctuations that may be either cyclic or irregular, but the process itself is normal. In the shrub-steppe, locusts, beetles, and hares are examples of naturally occurring animals whose populations are known to "explode" periodically. Several alien plant species occur on ALE. Alien species have the potential to replace native plants and also to become serious agricultural pests. Cheatgrass and Russian thistle are examples of alien plants that are firmly established in the shrub-steppe as part of the local flora. Some noxious weeds may occur on the ALE site. In addition, some native animals, particularly large, widely ranging herbivores and carnivores such as deer, elk, and coyotes have the potential to increase in number to the point where they may be considered agricultural nuisances because of losses that they cause to crops and livestock on adjacent private lands. Elk populations could increase to the point where local habitat degradation occurs on the ALE site.

Policy: Limit plant population control to noxious alien plant species in response to state regulation. Review monitoring data on nuisance wildlife populations on the ALE facility and make recommendations regarding control when appropriate.

Implementation: The ALE facility manager will coordinate with the Benton County Noxious Weed Control Board (currently being established as a result of action taken by the Benton County Commissioners in November 1991). The manager will further direct monitoring to determine the status of noxious species on the ALE site and, if requested by the board, will institute appropriate population control measures. Integrated pest management procedures will be used to minimize the impact on non-target plant species, and biological controls generally are preferred over chemical methods when the former are available. The ALE facility manager will also maintain communication with Washington State Department of Wildlife officials and with neighboring landowners to determine the nature and extent of nuisance wildlife complaints from neighboring private lands and will cooperate with state officials and landowners to formulate plans to minimize wildlife-related damage to crops, livestock, or native habitats.

4.2.10 Roadway and Utilities Right-of-Ways

Timing of maintenance and access to right-of-ways must be controlled to minimize disturbance to the site. Two primary types of roads exist on ALE. One is the asphalt surface designed for low-to-moderate traffic loads that leads from the Benton City highway through gate 106 and then to the PNL Atmospheric Sciences complex on the Rattlesnake Mountain ridge top and to the ALE Headquarters complex. Maintenance of the asphalt road is required to maintain all-season user access to the above-mentioned facilities and to permit rapid access by emergency vehicles. The types of maintenance that are appropriate for this roadway include asphalt surface repair, shoulder grooming, herbicide treatment and/or mowing of the roadsides, snow plowing, and sanding ice and compacted snow.

Policy: Maintain roadways and utility right-of-ways on ALE as non-intrusively as possible and at a level commensurate with their intended use.

Implementation: All road maintenance will be scheduled and conducted to minimize disturbance to the ALE landscape. Negative impacts that must be considered include increased runoff and subsequent soil erosion from the road shoulders and gully formation within roadside ditches, severe wind erosion and blowing dust from large exposed soil surfaces, and increased establishment of alien species in disturbed soils of roadway shoulders.

Virtually all other roadways and utility right-of-ways on ALE are unimproved and considered primitive. These roadways are intended to permit limited access to remote areas of ALE by approved site users and utilities maintenance. Road maintenance activities will include limited grading of the surfaces and the placement of local rock and gravels in some problem areas that become rutted. The ALE facility manager will monitor the conditions of the roadways and evaluate impacts of roadway maintenance to ensure that roadways remain serviceable, non-intrusive, and compatible with ALE management objectives. The ALE facility manager will maintain close contact with Hanford Site support services to ensure that the scheduling and extent of roadway maintenance services is conducted in such a manner as to maintain the roadways while minimizing adverse impacts to the environment. In particular, scheduling of maintenance will be coordinated to ensure that grading of primitive road surfaces is conducted when the road surfaces are moist and compacted (late fall through early spring) to minimize rutting of the dirt roadbed, and wind and water erosion.

4.2.11 Cultural Resources

Regulations governing the protection of cultural resources require evaluation and monitoring of activities on the ALE facility for compliance.

Policy: Activities conducted on the ALE facility will be subject to the directives of the Hanford Cultural Resources Management Plan (Chatters 1989).

Implementation: It is anticipated that the ALE facility manager will need to integrate and coordinate cultural resource study and other Native American site uses provided by this plan with Hanford Cultural Resources Management Plan administration.

4.2.12 Mineral and Energy Resource Exploitation

Drilling, mining, or uses of mineral or energy resources on ALE are incompatible with management plan objectives. Mineral rights on ALE are owned by the U. S. Government with these exceptions: Township 10N, Range 26E, Section 1 NE1/4; Township 11N, Range 26E, all of Sections 27 and 35 except the SW1/4 of Section 35. Residual mineral rights on these properties are held by Big Bend Alberta Company. It is recommended that all mineral rights on the RNA should be withdrawn from mineral entry, and residual mineral rights should be purchased. A permit from DOE is in place for the use of two gravel pits/borrow sites on ALE along Highway 240.

Policy: With the exception of two small parcels of land located along Highway 240 that are used periodically by the Washington State Department of Transportation as quarry

and stockpile sites for road and bridge maintenance materials, there will be no access to ALE for the purpose of drilling, mining, or other uses of mineral or energy resources.

Implementation: The ALE facility manager will monitor use of the two gravel pits and act to minimize impacts to ALE property, biota, or studies conducted thereon resulting from the use of the pits. He will further coordinate with the Washington State Department of Transportation to determine the continued need for the current use permit for the gravel pits, and then recommend that DOE either terminate the existing use permit or cause the permit to be modified such that the location of permitted gravel mining is shifted to a location outside the ALE site boundary.

ALE management will coordinate with appropriate DOE offices to evaluate the purchase of residual mineral rights on the RNA.

4.3 ADMINISTRATIVE AND ACCESS PROCEDURES

The following procedures outline the necessary steps to gain access to the ALE facility.

4.3.1 Access for Site Use for Research and Demonstration

Scientists and students interested in conducting research using ALE facilities and/or lands must coordinate their activities through the ALE facility manager. After an initial contact, the ALE facility manager will provide the researcher/student with a list of issues pertinent to the proposed research to be addressed and documented before access is approved. The researcher/student will:

- contact the ALE facility manager and provide him/her with information concerning the research activities and scheduling
- provide, in writing, a study plan either by a detailed letter or a formal proposal that
 - identifies the principal and contributing investigators
 - describes in detail the proposed research, including objectives and methods, size and location of any required study areas or plots, duration of study, and plans for minimizing disturbance
 - lists the facilities and equipment to be used and/or required
 - describes the terms and conditions of outside financial support for the research and the extent of such support
 - discusses the status of specific permits held or applications for permits in progress for activities such as the trapping and marking of wildlife or the collection of threatened plant species

- lists in detail any hazardous, toxic, carcinogenic, or radioactive materials to be generated or used in the study and a plan for complying with the Chemical Management Plan for the Earth and Environmental Sciences Center
- provide information concerning compliance of the proposed research with NEPA regulations
- demonstrate that all appropriate federal, state, and Hanford Site permits will be issued before work begins
- provide information required for work-approval clearance to gain access to the site including citizenship and social security number

Continued access to the site will be contingent on results of surveillances of the study area by the ALE facility manager. Penalties for not complying with NEPA requirements or ALE Management policies will involve termination of access privileges.

4.3.2 Access for Site Use for Educational Activities and Native American Cultural Activities^(a)

Teachers, students, and local Native Americans interested in using the ALE Site for education must coordinate that access through the ALE site manager and the appropriate program office at PNL according to the following procedures.

- Pre-university students and teachers will contact the PNL Science Education Center.
- University research programs and workshops will contact the University Programs Office and the ALE facility manager.
- University field trips and workshops leaders will provide the ALE facility manager with a letter describing planned activities while on ALE.
- Native Americans access for teaching, religious, and cultural activities will be coordinated through the ALE facility manager.

4.3.3 Access for Maintenance Activities

Access is required for maintenance of buildings, roadways, and utilities as well as occasional maintenance of fire protection systems. Building and grounds maintenance is scheduled through the facilities building manager for the ALE facility. Roadway maintenance

(a) Access for Native American cultural activities to include nonconsumptive use of the Site such as teaching, religious observance, and spiritual experiences but to exclude practices that are not compatible with the RNA status of the Site. Examples of incompatible practices include harvest of plants and animals, livestock grazing, and the use of horses or other conveyances for off-road travel that are not associated with a PNL approved research activity.

will be scheduled and coordinated with the ALE facility manager, and utilities maintenance will also be coordinated with the ALE facility manager, according to the following procedures:

- Routine fire protection activities not associated with the ALE headquarters buildings (activities requiring travel off paved roadways on ALE) will be scheduled and access approved through the ALE facility manager. Responsible personnel should contact the ALE facility manager for direction.
- Routine maintenance activities not associated with the ALE headquarters buildings and requiring travel off paved roadways on ALE must be scheduled and access approved through the ALE facility manager. Responsible personnel should contact the ALE facility manager for direction.

Any expansion of these activities (e.g., expansion of grounds, disturbance of naturally vegetated areas, or travel off paved roads) requires approval from the ALE facility manager.

4.3.4 Access for Visitors to ALE for Research or Education

Persons wishing to visit ALE should first contact an appropriate staff member or the ALE facility manager. ALE staff will provide escort for the visitor and provide information on restrictions regarding off-road travel, sampling, and/or gathering artifacts on ALE (see Appendix A).

The group or individual hosting visitors must provide information to the ALE facility manager, including names of visitors, purpose of visit, destinations on ALE, and date of visit. The ALE facility manager will authorize the visit and provide specific instructions or guidance regarding the visit to the host. The ALE facility manager will then initiate badging for the visitor through PNL badging.

4.3.5 Establishment of Formal Memoranda of Understanding

Natural areas may provide vital roles in future conservation, ecological monitoring, and education and scientific research efforts. A special Memorandum of Understanding (MOU) may be established to provide for possible interaction with and access by public and/or private agencies where the access procedures described in Section 4.3 are not appropriate. The MOU may be established between PNL and the interested party or between DOE and the interested party depending on the specific situation.

4.3.6 Contractor and DOE Required Support

Contractor (PNL) funding support is provided for periodic road maintenance, building maintenance, road maintenance, and special security overflights to ensure the integrity of ALE lands. Vehicles are also provided for use by the researchers. An on-site hazardous materials

custodian is supported at ALE to ensure compliance with the Laboratory Environmental Compliance Management Plan. Support from DOE will be required to meet the objectives of the plan in terms of 1) preserving sensitive habitats, 2) controlling access to the ALE facility, 3) providing oversight of educational, public, and interagency activities, 4) monitoring natural areas, 5) selectively supporting research to ensure availability of current ecological data for the Hanford Site, 6) maintaining data bases, and 7) providing management oversight of all the above functions.

5.0 MONITORING THE PLAN

This management plan provides for an external advisory committee consisting of one representative from research, one representative from education, one representative from among local Native Americans, and one Nature Conservancy representative to advise the ALE Facility (RNA) manager regarding scientific, educational and cultural/historical issues and concerns relating to site policy and management. The committee will conduct an annual review of both the RNA management policies contained in the plan (Section 6) and the activities conducted by implementing those policies.

The purpose of the review will be to 1) determine the adequacy of current policy in serving the management objectives and provide a vehicle for policy revision, 2) provide feedback to the ALE facility manager on the effectiveness of actions taken during the year to implement policy, and 3) inform the Richland Field Office and PNL management on the current status of ALE management and activities. Revisions to the management plan, if required as a result of the advisory committee review, will be drafted by the ALE facility manager and forwarded to the advisory committee within 60 days of completion of the review.

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6.0 REFERENCES

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APPENDIX A

ARID LANDS ECOLOGY FACILITY

FIELD PROCEDURES AND WORKING CONDITIONS/GENERAL INFORMATION

All work performed on the ALE facility must be accomplished in accordance with the Chemical Management and Hygiene Plan for the Earth and Environmental Sciences Center (EESC) and the EESC Environment Safety and Health Plan. **ALL** plants, animals, and artifacts within the facility are protected and cannot be removed without prior approval.

SAFETY. Above all else, perform your work in a safe manner. See the ALE facility manager if you feel at all concerned about the safety of working conditions.

USE OF VEHICLES. To operate government vehicles, a valid state driver's license is necessary. A trip log must be filled out each time a vehicle is used. Logs are kept in each vehicle. **REMEMBER:** Lock your vehicle when not in use. The following guidelines are to be observed when using vehicles in the field:

- Drive Safely. The time you may save is not worth the possibility of an injury or the hassle associated with an accident.
- Vehicles with catalytic converters are to be operated on maintained roadways only.
- Off-road vehicles should only be used on established trails and/or roadways.
- Reduce speed to match road conditions. As an example, 25 mph should be a maximum under the best of conditions on unpaved roads.
- Use of dirt roadways through the ALE facility should be minimized during the dry period of the year (May through September). Use paved roadways whenever possible.
- Fire extinguishers (2) and a shovel are required to be carried in field vehicles during the fire season (June-October).
- Taking vehicles off-site requires that an offsite vehicle pass be filed.

NOTE: Misuse of government vehicles will not be tolerated and will be grounds for disciplinary action.

FIELD WORK. When working in the field:

- Use the "buddy system." Tell someone where you are going and when you will return, or check out with support staff for Terrestrial Sciences (331 bldg: 376-7610 or 376-5642).
- Carry a hand-held radio. These can be checked out from the 331 Bldg. or at ALE Headquarters. If stranded, ask to talk to someone near a telephone, then have them relay a message for you.

- If you are going into a remote location such as Bobcat or Snively canyon alone, or working alone at night, you must check out beforehand. Remember to check back in when you return. If working late, arrangements will be made to have you check in with PNL Security (375-2154).
- If you encounter a fire that is already under way do not attempt to put it out. Report it to Security using the single point emergency number, 375-2400. Then leave the area at once; also inform the ALE facility manager, Lee Rogers, 376-8256 (331 bldg).

LABORATORY WORK. Observe good laboratory practice, maintaining clean, orderly, safe working areas; properly store records, material and/or equipment, and properly dispose of unused material and/or equipment. Observe safety eyeglass zones in designated areas of the lab. Check with the laboratory monitor for that lab before beginning work. The laboratory monitor's name and phone number are posted at the lab entrance. Movement of equipment into or out of any laboratory facility requires notifying the property custodian and laboratory monitor for that area. Movement of any equipment offsite will require a radiation release and physical equipment transfer.

HAZARDOUS MATERIALS. Any use of chemicals or other hazardous materials must first be cleared by the hazardous materials custodian (HMC) assigned to your location. Check the posting at the lab entrance to find the name and phone number of the HMC.

RADIATION ZONES. Areas marked as radiation zones (magenta and yellow tape) should not be entered without prior training. Dosimeters are required within a radiation-controlled area, and hand and foot counters must be used before leaving these controlled areas.

SENSITIVE EQUIPMENT. Weapons, cameras, contraband and explosives are prohibited with the following exception. Use of cameras and firearms requires specific passes and authorization.

ALCOHOLIC BEVERAGES. Alcoholic beverages and other controlled substances are not allowed.

TELEPHONE USE. The DOE long-distance telephone system is to be used only for official, government-related long-distance calls. Personal calls can be billed to your home phone.

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APPENDIX B

PERMITS

One or more permits may be required to conduct work on the ALE facility. Depending on the nature of the work, federal, state, or Hanford Site permits may be required. It is necessary that all site users have the required permits before beginning field work. This management plan also requires such permits for offsite investigators to access the site (see Section 3.4.1).

Federal Permits

Archaeological resources are protected under the Archaeological Resources Protection Act (ARPA) and the Antiquities Act of 1906. Work that may disturb archaeological deposits over 100 years old or the paleontological deposits associated with them requires issuance of a permit. The permitting process is described in 36 CFR 229, and the review process for such permit applications is provided in Chatters (1989).

Work with migratory species of wildlife requires a permit from the U.S. Fish and Wildlife Service. Individual investigators should apply to U.S. Fish and Wildlife Service for permits.

Washington State Permits

Wildlife species are regulated by the Washington State Department Wildlife. Applications for a permit to work with wildlife populations should be made directly to the Washington State Department of Wildlife, Olympia, Washington. The state permit is required in addition to the federal permit required for migratory species.

Hanford Site Permits

If planned burning has been approved by the ALE facility manager as part of work planned on the facility, the required daily burning permit may be obtained by contacting the Hanford Fire Department dispatch room after 7:00 am on the day of the planned burn. A permit will be issued by the Hanford Fire Department, if atmospheric and climatic conditions are such that burning is permitted.

References

Chatters, J. C. 1989. Hanford Cultural Resources Management Plan. PNL-6942, Pacific Northwest Laboratory, Richland, Washington.

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APPENDIX C

SENSITIVE HABITATS, RESEARCH AREAS AND FACILITIES
LOCATED ON ALE

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APPENDIX C

SENSITIVE HABITATS, RESEARCH AREAS AND FACILITIES
LOCATED ON ALE

Natural areas preserve significant examples of typical and rare terrestrial, aquatic, and marine ecosystems, special species, and rare geologic features. Because they retain their natural character and processes, they serve as baselines to compare with similar, but managed ecosystems [Washington State Department of Natural Resources (DNR 1991)]. The 1991 Natural Heritage Plan lists the terrestrial ecosystem elements (plant communities) of concern that are represented on the Rattlesnake Hills RNA (DNR 1991). These plant communities represent the different types of habitat available for wildlife on ALE (see Table C.1). The large elevational changes on the ridge and the two permanent springs contribute to large number of plant associations found on ALE as do the differing soil types. One sensitive species known to be located on ALE Piper's daisy, Erigeron piperanus Cronq., can be found in sagebrush plains on ALE.

The 1991 Natural Heritage Plan (DNR 1991) assigns a priority ranking for each terrestrial plant community identified. Assignment of a priority rank to a terrestrial element is based on its rarity, degree of threat, and how adequately it is protected in managed areas.

TABLE C.1. Terrestrial Plant Communities on the ALE Facility and the Priority Levels Assigned by the Natural Heritage Program

<u>Plant Community</u>	<u>Priority</u>
Willow riparian complex	1
Black greasewood/alkali saltgrass	(a)
Rock buckwheat/Sandberg's bluegrass	(b)
Thyme buckwheat/Sandberg's bluegrass	2
Big sagebrush/bluebunch wheatgrass	2
Spiny hopsage/Sandberg's bluegrass	3
Winterfat/Sandberg's bluegrass	3
Bluebunch wheatgrass/Sandberg's bluegrass	(c)

- (a) Exists on the Rattlesnake Hills RNA, but not listed by the Natural Heritage Plan (DNR 1991) as represented on the RNA, assigned priority 1.
- (b) Adequate protection exists.
- (c) Exists on the Rattlesnake Hills RNA, but not listed by the Natural Heritage Plan (DNR 1991) as represented on the RNA, assigned priority 2.

A priority level of 1 is the highest rank and indicates the greatest jeopardy of being destroyed or degraded. These elements typically have limited distribution in Washington, and very few occurrences in natural condition are known. Priority 1 elements have little or no representation in existing natural areas or other protected areas.

Priority 2 elements are at an intermediate priority because they are not in as much danger of being destroyed or degraded in the near future. These plant communities typically have regional distribution in Washington and few occurrences exist in a natural condition. Priority 2 elements usually have little or no representation in existing natural areas or protected areas, but may receive some de facto protection in other managed areas.

Priority 3 plant communities are not in immediate jeopardy of destruction in Washington, but are significant components of the state's natural heritage and require formal protection within the RNA. Typically, regionally distributed within the state, the number of known occurrences may vary greatly according to the plant community. These plant communities may be partially represented in existing natural areas.

MAPS OF HABITAT AND STUDY AREAS

Existing maps of vegetation on ALE provide information on current distributions of most of these plant communities (Hinds and Rogers 1991; vegetation map in Figure 2.4 of this document). Efforts continue to provide information on vegetation distribution and location of particular species. This information will be collected and then stored on a geographic information system. Map layers containing the locations of facilities, locations of research study areas, the location of sensitive species, and the distribution of plant communities can be easily accessed and displayed through GIS systems.

Future efforts will be directed to use global positioning systems to collect data on the coordinates of existing facilities on the ALE facility, as well as the positions of existing and past study area locations. These will be added to the GIS data base for use by ALE management staff as well as by parties interested in research on the RNA.

References

Hinds, N. R., and L. E. Rogers. 1991. Ecological Perspectives of Land Use History: The Arid Lands Ecology (ALE) Reserve. PNL-7750, Pacific Northwest Laboratory, Richland, Washington.

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APPENDIX D

FACILITIES LISTED FOR DECOMMISSIONING ON ALE

Several facilities located on the ALE facility have been identified for decommissioning. These include the 623A facility housing the radiotelescope at the top of the ridge; the 6652-O building, which functioned as boat storage; and the 6652-G building, which has been used for storage. These buildings have been proposed for decommissioning during FY 1993 under the PNL Strategic Facilities Plan for FY 1992. Funding for these operations is proposed to be provided through the MEL-FS (Multiprogram Energy Laboratory-Facilities Support) subprogram of the Energy Research Program.

Decommissioning is being pursued for the ALE Lysimeter Enclosure, which was used in the past for transuranic uptake studies. A sampling plan is being developed to support release of the lysimeter enclosure and soils for future use without radiological restrictions. This enclosure is located to the northeast of building 6652-E, and decommissioning will be conducted using funding support through PNL.

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