**Environmentally Sensitive Areas Surveys Program
Threatened and Endangered Species Survey
Progress Report**

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOE	United States Department of Energy
ER	Environmental Restoration
ERWM	Environmental Restoration and Waste Management
GIS	Geographic Information Systems
NEPA	National Environmental Policy Act
NRDA	Natural Resource Damage Assessment
OREIS	Oak Ridge Environmental Information System
ORR	Oak Ridge Reservation
T&E	Threatened and Endangered Species

1.INTRODUCTION

The Endangered Species Act (originally passed in 1973) is a Federal statute that protects both animal and plant species. The Endangered Species Act identifies species which are, without careful management, in danger of becoming extinct and species that are considered threatened (species that are likely to become endangered). Along with the designation of threatened or endangered, the Endangered Species Act provides for the identification of appropriate habitat for these species.

Since 1993, the United States Department of Energy's (DOE) Environmental Restoration (ER) Program has supported a program to survey the Oak Ridge Reservation (ORR) for threatened and endangered species. The Environmentally Sensitive Areas Surveys Program initiated vascular plant surveys during fiscal year 1993 and vertebrate animal surveys during fiscal year 1994 to determine the baseline condition of threatened and endangered species on the ORR at the present time. Data collected during these surveys are currently aiding Comprehensive Environmental Reponse, Compensation, and Liability Act (CERCLA) Remedial Investigations on the ORR. They also provide data for ER and Waste Management (ERWM) decision documents, ensure that decisions have technical and legal defensibility, provide a baseline for ensuring compliance with principal legal requirements [including the Endangered Species Act, the National Environmental Policy Act (NEPA), CERCLA, Natural Resource Damage Assessments (NRDA), and the Clean Water Act (CWA)], and will increase public confidence in DOE's adherence to all related environmental resources rules, laws, regulations, and instructions. This report discusses the progress to date of the threatened and endangered species surveys of the ORR.

2.VASCULAR PLANT SURVEYS

The identification of vascular plant species that have been Federally listed, proposed for listing, or are candidate species for Federal listing; placed on the State of Tennessee list; or are of special concern that occur on the ORR is a primary concern of the surveys. In addition, the identification of potential habitat for such species on the ORR is another purpose for conducting the plant surveys. The information collected during the surveys will enable ER project managers to either proceed with planned remedial actions or alter the planned actions to accommodate the listed plant species identified at their site.

Threatened and endangered species are protected under the Endangered Species Act of 1973, as amended. The procedures for implementing provisions of the act are contained in 50 CFR Part 402. The U.S. Fish and Wildlife Service is the primary agency responsible for enforcing provisions of the Endangered Species Act. Agencies considering an action must request a listing of threatened, endangered, and candidate species, along with any critical habitat determinations, from the U.S. Fish and Wildlife Service; if threatened or endangered species or their habitats are present in the areas of the project, the agency must prepare a biological assessment of project impacts on each species or habitat. The current assessment will be adequate to be included as an attachment to future documentation.

2.1 SURVEY DESIGN

2.1.1 Compilation of Existing Data

Updated State and Federal rare plant lists were obtained from the Tennessee Department of Environment and Conservation and the Federal Register. Data from previous plant surveys on the ORR were reviewed

and evaluated for completeness. A preliminary map of areas for which rare plant data were available was prepared using geographic information systems (GIS); this coverage was then overlaid onto the ORR ER operable units map to determine the availability of rare plant data for the operable units. A listing and descriptions of environmentally sensitive sites known to contain rare plants or rare communities on the ORR were prepared. A list of vascular plants known from the ORR was compiled. Range information, habitat requirements, life cycle characteristics (such as dates of emergence, flowering, and setting of fruit or seed), and distinguishing morphologic features for rare plant species known from the Ridge and Valley Physiographic Province of Tennessee were compiled from taxonomic literature. A list of rare plant species known from the Ridge and Valley Physiographic Province of Tennessee, which might potentially occur in the habitat types found on the ORR, was compiled. A list of rare plant species known from areas near the ORR, but which had not been found on the ORR, was compiled. Landscape features frequently associated with rare species presence on the ORR were identified. Areas of special interest where rare species might be likely to occur on the ORR based on geologic or other features were identified.

2.1.2 Field Surveys

Field surveys are conducted to locate and identify rare plant species and sensitive habitats on the ground. Areas of the ORR lacking sufficient information concerning rare plants and sensitive habitats were ranked for urgency of field surveys and were selected for site visits in a roughly descending order, based on the following priorities: 1) operable units that had not yet been surveyed, 2) areas where projects have been proposed, 3) areas most likely to be impacted in the near future, 4) areas of special interest, based on geologic or other features, where rare species might be likely to occur, and 5) remaining areas. In addition, selected areas with known rare plant populations are visited to collect baseline data on those populations.

Field surveys are conducted by trained biologists familiar with the regional flora and distinguishing morphologic characteristics, life cycles, and habitats of the rare plant species occurring or potentially occurring in the area to be investigated. Field surveys may require multiple site visits when taxonomic identifications require plant parts available during other seasons ("seasonal identification"), when environmental conditions are unfavorable for the growth and/or observation of a species, or when population monitoring efforts are initiated. Types of records produced in the course of field surveys include field notes, species lists, data sheets, maps, photos, herbarium specimens, and written reports. The following types of methods are applied in the course of field surveys and are presented in order of decreasing areal scale and increasing level of detail of data provided: exploration, systematic search, and population monitoring.

Exploration is the least costly and labor-intensive method and is generally applied over areas on a scale of 10 to 1000 acres. In an exploration, landscape features frequently associated with rare species present on the ORR are sought out and identified during the site visit and ground coverage is skewed towards those areas most likely to yield important results. Landscape features commonly associated with rare species on the ORR include wetlands, springs, barrens, steep slopes, rock outcrops and cliffs, streams, unusual disturbances, and areas where woody growth is suppressed and natural vegetation dominates, such as under power lines.

A *systematic search* is the method of choice when intensive disturbance is planned for a specific site and increased documentation is required for legal purposes. A systematic search is generally applied over a scale of 2-10 acres. During a systematic search, the entire area is walked and searched for rare plant species in a pattern of transects that allow more complete visual coverage of the site, taking into account topographic features (such as hills and obstacles) and existing sight range limiting conditions (such as light level, fog,

and vegetation density). The surveyor develops and maintains mental search images of the potential rare species occurring on the ORR by visiting sites where they have been found and by viewing photographs prior to the search. The surveyor also must maintain an alertness to unusual conditions or features which may signal the presence of a rare species.

Population monitoring is used to provide detailed baseline population data for selected rare species. Monitoring is generally applied on a scale of less than an acre to 2 acres. The level of detail involved in a monitoring effort ranges from simply checking for the continued existence and reproduction of a species at a site, to population estimates, to direct population counts, to determination of age, size, and /or sexual structure of the population. In addition, ancillary information about the site, such as topographic position, slope, aspect, light conditions, moisture levels, disturbances, and presence of pollinators, may also be collected. Finally, subpopulation boundaries may be marked for their protection in zones of potential disturbance and/or for mapping using a global positioning unit.

2.1.3 Documentation

Existing data and field survey data will be combined to develop a rare plant and sensitive habitat computer database for the ORR using FoxPro Database software. The database will include sensitive habitat descriptions, available rare species population data, historical records, and photographic images. The database will be supported by the development of a vascular flora checklist and herbarium records.

Mapped coverages of rare plant species and sensitive habitat locations are being input into a GIS in the Oak Ridge Environmental Information System (OREIS). Map data are input into the GIS through digitizing and/or use of global positioning systems. A protocol for how information is accepted and updated in OREIS will be developed with OREIS and ER. Access to some kinds of information (e.g. , actual locations of rare species) will be restricted.

2. 2 PLANT SURVEY SUMMARY

As sites are currently surveyed, letter reports are written and forwarded to the DOE ER Environmentally Sensitive Areas Program Manager. The DOE Manager then forwards copies of these reports to the United States Fish and Wildlife Service. Copies of all letter reports completed to date are included in this report as Appendix A.

2. 2. 1 Compilation of Existing Data

Existing data were compiled and published in the following volumes during the Fall of 1993:

Cunningham, M. , et al. 1993. Resource Management Plan for the Oak Ridge Reservation , v. 29: Rare Plants on the Oak Ridge Reservation . Environmental Sciences Division publication No. 3995. Oak Ridge National Laboratory, Oak Ridge, TN.

Pounds, L. R. , P. D. Parr and M. G. Ryon. 1993. Resource Management Plan for the Oak Ridge Reservation , v. 30: Oak Ridge National Environmental Research Park Natural Areas and Reference Areas-Oak Ridge Reservation environmentally sensitive sites containing special plants, animals, and communities. Environmental Sciences Division publication No. 4054. Oak Ridge National Laboratory, Oak Ridge, TN.

2.2.2 Field Surveys

More than 10,000 acres of the ORR have been surveyed for rare plants to date. Nineteen vascular plant species that have been Federally listed, proposed for listing, or are candidate species for Federal listing, placed on the State of Tennessee list, or are of special concern, have been found on the ORR to date (Table 1). New subpopulations of rare plant species that have been discovered outside of existing Natural Area Boundaries total 13 to date (and correspond to proposed new Natural Areas and proposed enlargements of existing Natural Areas). Concurrently, the following needed revisions to the Natural and Reference Areas identified in the field have been compiled and will be reviewed: nine new Natural Areas, four Natural Area enlargements, one mapping correction for a Natural Area, three new Reference Areas, and two corrections to Reference Area mapping (Table 2). Finally, collected plant specimens that are believed to represent species not previously known to exist on the ORR have been proposed for addition to the floral list pending review; a total of 77 species have been included to date (Table 3).

The most significant rare plant survey projects initiated to date, in order from largest to smallest, are the Operable Units Surveys, the Pine Plantation Surveys, the Poplar Creek Wetlands Surveys, the Special Interest Areas surveys, and the Rare Plant Population Monitoring project (Table 4). Field surveys for all Operable Units were completed during 1993, and more than 7,500 acres within and around the operable units were surveyed. Field surveys in Pine Plantations under consideration for Southern Pine Beetle timber salvage operations were conducted during the fall and winter of 1993 and the spring of 1994; more than 3,000 acres proposed for timber salvage have been surveyed to date. Exploration of wetlands along Poplar Creek was initiated during summer 1994, and approximately 150 acres have been covered. Field surveys of Special Interest Areas were initiated during the summer of 1994, and approximately 100 acres of the Special Interest Areas have been surveyed to date. Rare plant population monitoring was initiated during the summer of 1994 for the following species: *Lillium canadense*, *Platanthera peramoena*, *Platanthera flava* var. *herbiola*, *Saxifraga careyana*. Population data have been collected for 17 subpopulations of these four species to date. Approximately 50 acres have been covered during monitoring efforts in Natural and Reference Areas.

2.3 DOCUMENTATION

Digitization of map data and computer database development for sensitive habitats was initiated during the summer of 1994. Marking of boundaries of selected subpopulations for use with global positioning system was initiated during the summer of 1994.

2.4 PLANNED WORK

Field surveys (including requested areas, special interest areas, remaining areas of the reservation, population monitoring, site re-visits for seasonal taxonomic identifications) are ongoing and will continue through August of 1995.

**Table 1. Plant species found on the Oak Ridge Reservation (ORR)^a
that are listed by State or Federal agencies**

<u>Species</u>	<u>Common name</u>	<u>Habitat on ORR</u>	<u>Status^b</u>
<i>Aureolaria patula</i>	Spreading false-foxglove	River bluffs	C1, T
<i>Carex grvida</i>	Gravid sedge	Varied	S
<i>Cimicifuga rubifolia</i>	Appalachian bugbane	River slopes	C2, T
<i>Cypripedium acuale</i>	Pink lady-slipper	Dry to rich woods	E*
<i>Delphinium exaltatum</i>	Tall larkspur	Barrens, woods	C2, E
<i>Diervilla lonicera</i>	Northern bush-honeysuckle	River bluffs	T
<i>Draba ramosissima</i>	Branching whitlow-grass	Limestone cliffs	S
<i>Elodea nuttallii</i>	Nuttall waterweed	Ponds, embayments	S
<i>Fothergilla major</i>	Mountain witch-alder	Woods	T
<i>Hydrastis canadensis</i>	Golden seal	Rich woods	T
<i>Juglans cinerea</i>	Butternut	Slopes near streams	C2, T
<i>Juncus brachycephalus</i>	Small-head rush	Wetlands	S
<i>Lilium canadense</i>	Canada lily	Moist woods	T
<i>Liparis loeselii</i>	Fen orchid	Forested wetland	E
<i>Panax quinquefolius</i>	Ginseng	Rich woods	3C, T
<i>Platanthera flava</i> var. <i>herbiola</i>	Tuberculed rein-orchid	Forested wetland	T
<i>Platanthera peramoena</i>	Purple fringeless orchid	Wet meadow	3C, T
<i>Saxifraga careyana</i>	Carey saxifrage	River bluffs, sinks	C3, S
<i>Spiranthes ovalis</i>	Lesser ladies tresses	Moist to dry woods	S

^aOther similar lists for ORR include *Lilium michiganense*. It is excluded here because it is not definitely known to be currently on the ORR.

^bStatus codes (see Appendix A for full explanation):

- C1 — Candidate for federal listing. Proposed listing considered likely.
- C2 — Candidate for federal listing. More information needed to determine status.
- C3 — Taxa no longer considered for federal listing. Subcategories indicate reasons.
- 3C — Taxa more widespread or abundant than previously thought, or taxa not subject to immediate threat.
- E — Endangered in Tennessee.
- E* — Endangered in Tennessee due to commercial exploitation.
- T — Threatened in Tennessee.
- S — Special Concern in Tennessee.

**Table 2. Proposed revisions to the National Environmental
Research Park sensitive areas**

I. New Natural Areas (PNA) listed by species of concern:

1. PNA-A. *Lillium (canadense or michiganense)*
2. PNA-B. *Lillium (canadense or michiganense)*
3. PNA-C. *Lillium (canadense or michiganense)*
4. PNA-D. *Draba ramosissima*
5. PNA-E. *Delphinium exaltum*
6. PNA-F. *Juncus brachycephalus*
7. PNA-G. *Collinsonia verticillata*
8. PNA-H. *Collinsonia verticillata* (Reference Area 1)
9. PNA-I. *Collinsonia verticillata* (Reference Area 2)

II. Natural Areas (NA) to be Enlarged:

1. NA 6
2. NA 7
3. NA 22
4. NA 8

III. Corrections of Mapping of Natural Areas (NA):

1. NA 10

IV. New Reference Areas (PRA):

1. PRA-A. Bearden Creek Water Gap
2. PRA-B. 0700 Barren
3. PRA-C. ORNL "Deerless Area"

V. Corrections of Mapping of Reference Areas (RA):

1. RA 10
2. RA 23

**Table 3. Proposed additions to the Oak Ridge Reservation vascular flora
(discovered since 1991, currently under review)**

<i>Allium ampeloprasum</i> <i>Ambrosia bidentata</i> <i>Anthoxanthum odoratum</i> <i>Arabis canadensis</i> <i>Aristida dichotoma</i> <i>Asclepias viridiflora</i> <i>Aster divaricatus</i> <i>Aster laevis</i> <i>Aster praealtus</i> <i>Aster vimineus</i> <i>Bidens bipinnata</i> <i>Bromus latiglumis</i> <i>Bromus tectorum</i> <i>Cardamine multifida</i> <i>Carex eburnea</i> <i>Carex gracillima</i> <i>Carex retroflexa var. texensis</i> <i>Carex stipata</i> <i>Cirsium arvense</i> <i>Comandra umbellata</i> <i>Cornus drummondii</i> <i>Crataegus calpodendron</i> <i>Cyperus pseudovegetus</i> <i>Danthonia compressa</i> <i>Desmanthus illinoensis</i> <i>Desmodium glutinosum</i> <i>Draba ramosissima</i> <i>Eleocharis parvula</i> <i>Elodea canadensis</i> <i>Eragrostis curvula</i> <i>Euphorbia humistrata</i> <i>Eupatorium aromaticum</i> <i>Festuca obtusa</i> <i>Galax aphylla</i> <i>Gaultheria procumbens</i> <i>Gnaphalium purpureum</i> <i>Helenium nudiflorum</i> <i>Helianthus decapetalus</i> <i>Helianthus divaricatus</i>	<i>Hordeum pusillum</i> <i>Houstonia canadensis</i> <i>Hypericum hypericoides</i> <i>Hypericum prolificum</i> <i>Iris shrevei</i> <i>Iva annua</i> <i>Juncus brachycephalus</i> <i>Lechea racemulosa</i> <i>Leersia hexandra</i> <i>Linaria canadensis</i> <i>Linum sulcatum</i> <i>Muhlenbergia tenniflora</i> <i>Panicum longitolum</i> <i>Panicum varigatum</i> <i>Phaseolus polystachius</i> <i>Phlox stolonifera</i> <i>Poa sylvestris</i> <i>Polygonum cuspidatum</i> <i>Prenanthes altissima</i> <i>Quercus michauxii</i> <i>Rhexia mariana</i> <i>Rhus aromatica</i> <i>Rubus phoenicolasius</i> <i>Salix alba</i> <i>Scirpus fluviatilis</i> <i>Sicyos angulatus</i> <i>Smilax hugeri</i> <i>Sparganium americanum</i> <i>Spenopholis intermedia</i> <i>Spiranthes tuberosa</i> <i>Sporobolus clandestinus</i> <i>Sporobolus poiretii</i> <i>Stipa avenacea</i> <i>Strophostyles umbellata</i> <i>Tussilago farfura</i> <i>Veronica arvensis</i> <i>Viburnum prunifolium</i> <i>Vinca minor</i>
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Table 4. Field Survey Summary Data

Survey Name	Months of Survey	Year of Survey	Estimated Area Covered (acres)	Method*	Number of Rare Species	Sensitive Habitats*	Priority for Revisit*	Records*	Investigators*	Comments
Operable Units (OU):										
CR OU 1		91	10	S	0		4	r,m	L.P.	
CR OU 2		91	10	S	1	We,Ot	3	r,m	L.P.	Ot=Ash
CR OU 3		91	1	S	0		4	r,m	L.P.	
CR OU 4		91	5	S	0	Ro	3	r,m,h	L.P.	
Bethel Valley GW OU	4,5,6,9,8	93,94	1650	S, M	7	Ro, Ba, Sp, We	3	r,m,h	L.P.	
Melton Valley GW OU	4,5,6,7,8	93	2000	S	7	We	1	r,m	L.P.,R.C.	
UEFPC OU 1	4,9	93	200	S	1		4	r,m	L.P.	Seasonal identification needed
South Campus Facility OU	6	93	45	S	0		1	r,m	L.P.	Seasonal identification needed
Freels Bend OU	6,7,8	93	20	S	0		3	r,m	L.P.,R.C.	
Bear Creek OU 4	7,8,9	93	1,800	S	5	We,Ro,Sp,Ot	3	r,m	L.P.,R.C.	Ot=Beech/Mtn.Laurel
K-25 GW OU	7,8,9,4,7	93,94	2,100	S	3	Ro, Ba, We	1	r,m,p,h	L.P.,R.C.	
Requested Surveys:										
Pine Plantations	8 to 5	93,94	3000+	E, S	1	We,St,Sp,Ba,Ro	1	r,m	L.P,D.A.,B.R., B.W., L.M.	Seasonal identification needed
Poplar Creek	8	94	150	E	1	We	2	n,l	D.A.,B.R.	
E. TN Natural Gas	8	94	3	S	1	We	3	r	D.A.,L.P.	
Special Interest Areas:										

Table 4. (continued)

Survey Name	Months of Survey	Year of Survey	Estimated Area Covered (acres)	Method*	Number of Rare Species	Sensitive Habitats*	Priority for Revisit*	Records*	Investigators*	Comments
West HPRR area	4,6	94	8	E	0		3	n,h	L.P.	
K-25 Pumping Station	4,7	94	6	S	3	Ba,Ro	2	n,p,h	L.P.,D.A.	
Bearden Embayment	6	94	2	M	1	We	3	n,h	L.P.	
Pine Ridge (West end)	4,7,8	94	50	E	0		3	n,h	L.P.	
Black Oak Ridge (West end)	4,8	94	17	E	2	We	2	n,h	L.P.	
area around Natural Area 7	8	94	9	E	1	Ro	2	n,h	L.P.	
area West of Reference Area 1	8	94	15	E	0		2	n,h	L.P.	
National Environmental Research Park Sensitive Areas:										
Natural Area 2	7,8	94	10	S,M	1	Ba	4	r,d	R.C.	
Natural Area 7	8	94	4	S	1	Ba	4	r,d	R.C.	
Natural Area 8	8	94	5	S	3	Ro, We	1	n	D.A.,L.P.	Seasonal identification needed
Natural Area 10	8	94	2	S	4	Ra, Ot	4	r,d	R.C.,D.A.	Ot=mature mesic hardwood
Natural Area 11	7	94	2	S,M	1	St	4	r,d	R.C.	
Natural Area 13	7	94	1	S,M	1	We	3	r,d	R.C.,D.A.	
Natural Area 14	7	94	5	S,M	1	We,Ot	4	r,d	R.C.,D.A.	Ot=upland grasslands
Natural Area 19	8	94	10	E,M	1	Ro	3	n	L.P.	
Natural Area 21	7	94	3	S,M	0	Ot	4	r,d	R.C.,D.A.	Ot=rocky limestone forest
Natural Area 22	6	94	3	S,M	2	Ro	2	r,d	R.C.,D.A.	
Natural Area 24	8	94	2	M	1	We	3	n,h	L.P.	
Natural Area 25	6	94	9	S,M	1	St	1	r,d	R.C.,D.A.	
Natural Area 26	6	94	2	S,M	2	Ro	1	r,d	R.C.,D.A.	
Natural Area 27	8	94	1	S	1	We, Ba	1	n	R.C.,D.A.	
Reference Area 1	8	94	5	E	1	Ro	2	n,h	L.P.	
Reference Area 29	6	94	6	S,M	1	We	4	r,d	R.C.,D.A.,L.P.	

Table 4. (continued)

*** Explanation of Codes**

<u>Methods</u>	<u>Priority for Revisit</u>	<u>Investigators</u>
E=Exploratory Survey	1=Highest	B.R.= Barbara Rosensteel
S=Systematic Survey	4=Lowest	B.W.= Beth Wade
M=Population Monitoring		D.A.= Deborah Awl
		L.M.= Linda Mann
		L.P.= Larry Pounds
		R.C.= Rebecca Cook
<u>Sensitive Habitats</u>	<u>Records</u>	
We=Wetland	r=report	
St=Stream	m=maps	
Sp=Spring	d=data sheets	
Ba=Barrens	h=herbarium specimen	
Ro=Cliff/Rock Outcrop	p=photographs	
Ot=Other	n=field notes	
	l=species list	

The following documentation projects are ongoing with projected completion dates in parentheses:

- Preliminary Map of Field Surveys (October 1994)
- Preliminary draft of proposed Sensitive Area revisions (November 1995)
- Preliminary Vascular Flora Checklist (January 1995)
- Photography of Rare Plants and Sensitive Habitats (September 1995)
- Computer database data compilation and input (October 1995)
- Mapping (Digitizing and GPS) (October 1995)
- Evaluations of proposed additions to the Vascular Flora (October 1995)
- Herbarium specimens collection, identification and mounting (continuing)

Submission of the Final Report, including recommendations for management and protection of sensitive habitats on the ORR, and maps of field surveys and sensitive habitats is planned for the end of November 1995.

3. VERTEBRATE ANIMAL SURVEYS

Environmental regulations concerning the management of areas for game as well as nongame species have mandated the need for identification and protection of diminishing wildlife resources. The National Environmental Policy Act of 1970 (NEPA) was one of the first regulations that established the need for identifying and preserving our vanishing natural resources. Several laws have emphasized the need for the protection of certain wildlife species. The most notable statutes are the Fish and Wildlife Coordination Act of 1934 (amended 1965) and the Endangered Species Act of 1973. The Endangered Species Act identifies certain species who, without careful management, are in danger of becoming extinct. Corollary to Federal laws are State laws, like the Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974, that include not only federally listed species but also species of special concern within the state. Tennessee defines listed species as threatened, endangered, or in-need-of-management. The state laws recognize the necessity for careful management to protect these animals as well as areas containing habitat necessary for their survival.

Identifying threatened and endangered vertebrate species (T&E) that reside on, use, or migrate through the ORR is necessary to maintain compliance with regulatory mandates to protect these species. Previous animal studies provide a historical index to the ORR fauna. These data also provide insight for identifying T&E animal species that could occur on the ORR (Howell & Dunaway 1958, Howell 1958, Johnson 1964, Kroodsma 1987, Ryon & Loar 1988, Klein 1989, Kroodsma 1993). Some of the areas surveyed for these studies have been substantially altered. New surveys are necessary to identify T&E animals currently using the ORR. Without this information, valuable habitat could be unknowingly and irreparably damaged or lost and result in the inadvertent extirpation of some endemic T&E species.

Compliance with regulations affecting T&E species is mandated. Noncompliance with these regulations can result in the assessment of substantial penalties. The laws specify that areas where T&E animals are located must be protected. Although information exists identifying the animals of the ORR, many of the data were collected prior to 1990. Therefore, these data must be validated by current surveys to reduce the risk of regulatory non-compliance. This study will validate historical data possibly locating T&E species on the ORR. Information updating habitat types will be compiled and areas needing protection

on the ORR may be identified. Management may need information from this study so compliance with T&E regulations can be determined and maintained.

3.1 SURVEY DESIGN

3.1.1 Survey Design for Listed Avian Species

A list of birds identified as using or occurring on the ORR was compiled from previous bird surveys and observations. This list was compared to State and Federal lists of threatened, endangered, and in-need-of-management / candidate species. From this information a list of T&E species for the ORR was generated. The ORR T&E list was compared with historical information and some survey locations were identified. General information pertaining to habitat requirements for each of these species was used to identify additional ORR survey areas.

Birds are surveyed at 160-ft intervals for 15 minutes in ORR areas likely to have T&E species. Avian vocalizations can be heard for long distances, so a long distance between survey points is used to reduce redundant bird observation. These surveys require familiarity with each bird's distinguishing physical characteristics and their audio signatures. (Audio observations are more frequent than visual observations.) All species seen or heard within the 15-minute time interval are identified and recorded on a data sheet. Unfamiliar or unidentifiable vocalizations can be audio recorded and identified in the office when compared to professional audio field guide recordings. Photographs are taken, when possible, of identified and questionable birds observed. A separate data sheet is used for each area surveyed. The data sheets include the species observed and information about the location, time of day and weather conditions.

Surveys will be conducted throughout the year for species that use the ORR for all or a portion of their required habitat. Critical times, such as migration, will receive more attention.

3.1.2 Survey Design for Mammalian Species

A list of mammals identified as using or occurring on the ORR was compiled from previous surveys and observations. This list was compared to state and federal lists of threatened, endangered, and in-need-of-management / candidate species. From this information, a list of ORR T&E species was generated. This ORR T&E list was compared with historical information, and some survey locations were identified. General information pertaining to habitat requirements for each of the ORR T&E species was used to identify additional survey areas.

Mammals are surveyed by the placement of Sherman live traps along a transect. Each trap is approximately 3 in. wide by 9.5 in. long. This size trap accommodates all of the small mammals included in this survey. Mammals are surveyed by placing approximately five live traps at 10-meter intervals along a 50-meter transect line. Fifty traps are placed along each transect line so each area surveyed has 150 traps set each night. Every trap set times the number of nights the trap is set equals one trap-night. Therefore, for each area surveyed there are 150 trap-nights accumulated each night the traps are set. Surveys are conducted in each area for three consecutive nights. A total of 450 trap-nights is accomplished for each survey area during each survey period.

Three transects are placed in each surveyed area. Two of the three transects are positioned perpendicularly to one another while the third transect is positioned tangentially.

This trap arrangement not only improves the chance of a complete survey of the area but also increases the chance for live capture success of target species.

Bait used for trapping is a combination of raw peanuts, oats, and bird seed (which is mainly millet with some sunflower seeds). Hulls from the raw peanuts are left in the bait mixture to provide some bedding material for captured animals. The traps are baited and set in the early evening on the first day of a 3-day survey period. Several listed animals such as the shrews have high metabolic rates; therefore, the traps are checked throughout the night to minimize animal mortality.

Species trapped are identified and then released. Photographs are taken to document species of interest and to aid in the identification of questionable captures. All species captured are identified and recorded on data sheets for the area. Unfamiliar or unidentifiable species are identified later in the office by comparing field photographs with other resources. A separate data sheet is used for each area surveyed. The data sheets include not only the species observed but also information about the location, time of day, and weather conditions.

Wooden boards have also been placed at various locations throughout the ORR. These boards provide shelter for small mammals as well as amphibians and reptiles. The boards are checked weekly for mammals, amphibians, and reptiles. All species observed are recorded on separate data sheets for each area. Additionally, drift fences with pit fall traps have been located at several areas throughout the ORR. The drift fences were constructed from garden netting, usually used to curtail weed growth, that was cut into 12 in. strips. Each strip is from 30 to 100 ft long and has 5-gallon buckets located at approximately 10 ft intervals along its length. (Each bucket had drain holes drilled in the bottom to facilitate water drainage.) Holes were excavated either beside or directly beneath the center of the erected drift fence to accommodate each bucket. The buckets were placed into the holes such that the opening of the bucket was flush with the ground. The buckets are opened early in the morning and checked throughout the day. They are closed each night to prevent entry and the inadvertent death of small animals with high metabolic rates. All captures are recorded on separate data sheets for each area.

Bats present a special problem. They cannot be identified while in flight so it is necessary to either locate a roosting area or trap them. Two harp traps were built for the live capture and release of bats. Each of the traps consists of two frames (approximately 4 ft wide by 6 ft tall) that are strung with 6-pound monofilament line. The monofilament line stretches tightly from the top to the bottom of the frame (like a harp) and is spaced at approximately .5 in. intervals. These strung harps are positioned parallel to one another and are held within a frame. A holding bag is positioned at the bottom of the harps to collect bats confounded by the apparatus. The collection bag is ventilated to prevent accidental asphyxiation of captured bats. To use the trap successfully, it must be placed at a roost cave entrance or within a fly-way that has been

altered to direct the flight of the bats into the trap. The traps were recently completed and have not yet been used at the ORR.

Mammals will continue to be surveyed at critical times throughout the year to increase the possibility of observing listed species.

3.1.3 Survey Design for Listed Amphibian and Reptile Species

A list of amphibians and reptiles identified as using or occurring on the ORR was compiled from previous surveys and observations. This list was compared to lists of state and federal threatened, endangered, and in-need-of-management / candidate species. From this information, a list of ORR T&E species was generated. The ORR T&E list was compared with historical information, and some survey locations were identified. General information pertaining to habitat requirements for each of these species was used to identify additional ORR survey areas.

Amphibians and reptiles are surveyed in several different ways. Turtles are trapped in hoop nets baited with cat food, sardines, or other odorous materials. The trap consists of three parallel 3.5-ft metal hoops connected together by netting with 1.5 in. holes. Turtles as well as fish swim into the trap and are unable to escape. Floats are placed in the traps to insure the existence of air pockets for the turtles. These traps are set and baited at the first of the week and then checked twice daily, in the morning and evening, for captured animals. This continues for 3 to 4 consecutive days. Species trapped are identified, scored for recapture identification, and then released. Photographs are taken to document species of interest and aid in the identification of questionable captures. All species captured are identified and recorded on data sheets for the area. Unfamiliar or unidentifiable species are identified later in the office by comparing the photograph to other photographs of identified species. A separate data sheet is used for each area surveyed. The data sheets include all species observed and information about the location, time of day and weather conditions.

Wooden boards have also been placed at various locations throughout the ORR. These boards provide shelter for amphibians, reptiles, and small mammals. The boards are checked weekly for amphibians and reptiles. All species observed are recorded on a separate data sheet for each area. Additionally, drift fences with pit fall traps have been located at several areas throughout the ORR. The drift fences were constructed from garden netting, usually used to curtail weed growth, that were cut into 12 in. strips. Each strip is from 30 to 100 ft long and has 5-gallon buckets located at approximately every 10 ft. Holes were excavated to accommodate each bucket so the opening of the bucket is at ground level. The buckets are opened early in the morning and checked throughout the day. They are closed each night to prevent the inadvertent death of small animals with high metabolic rates. All captures are recorded on separate data sheets for each area.

Amphibians and reptiles will continue to be surveyed at critical times throughout the year to increase the possibility of observing listed species.

3.2 HABITAT ANALYSIS

Each survey area is analyzed for physical and vegetation characteristics. Physical characteristics include parameters such as elevation, latitude, longitude, slope, and compass aspect. These are used to accurately locate each area. Topographic, slope, soil, and geologic information provide information about area drainage and the vegetation that might be located there. Distances from water and manmade features give an indication of the amount of disturbance expected in the area. For example, a highway located close or within a survey area usually indicates a high level of continual disturbance. Vegetative parameters such as major ground species, major overstory species, canopy cover, vegetative height, and litter depth give a picture of what is actually found in the area. Species present and average diameters at breast height (DBH) for trees give an indication of the area's age.

Physical and vegetative characteristics provide a way of evaluating and comparing survey areas to one another. When areas exhibit comparable characteristics, they can be expected to have the same or comparable animal populations. This also means that dissimilar areas can be expected to have different animal populations. Habitat analysis provides a reasonable way of comparing surveyed areas with nonsurveyed areas so animal habitation can be predicted. Nonsurveyed areas possessing attributes similar to surveyed areas that have threatened, endangered or in-need-of-management species can be predicted to also have the same T&E species. Additionally the habitat analysis, when compared to specific habitat requirements for each animal, may also indicate that a particular species should be in an area even though capture attempts may have failed. This is particularly helpful when trying to ascertain presence or absence of some of the more elusive species such as the Pine Snake (*Pituophis melanoleucus melanoleucus*). The habitat analysis coupled with habitat requirements for each species provides a way of evaluating the entire ORR for T&E species even though actual surveys of the entire ORR will not be performed.

A point intercept method is used to perform the actual habitat analysis of each survey area. Data are collected at 10-meter intervals along each of the three 50 meter transects located in each survey area. Any plant that touches the line, passes over the line, or passes under the line is considered as contacting the line. All contacts with the line are included within the area survey. The length of contact with the line is measured and recorded. This measurement is used to calculate the percent linear dominance and identify the major vegetative species. Additionally, areas of bare soil or rock contacting the line are also measured, recorded, and reported as a feature of the survey area. These types of bare areas are important to several of the listed species. Separate data sheets are used to record data from for each survey area.

3.3 ANIMAL SURVEY SUMMARY

Sites are surveyed repetitively due to the transient nature of vertebrate animal species. Monthly summaries are written and are included in this report as Appendix B. Species identified in **bold** typeface are species that are listed on either the Federal or the State of Tennessee lists as threatened, endangered, or in-need-of-management. Table 5 lists the vertebrate animal field surveys that have been conducted to date.

3.3.1 Survey Summary for Avian Species

Birding surveys are being conducted throughout the ORR. Surveys are conducted at 15-minute intervals in sites spaced 160 meters apart. Birds are identified by listening to their calls or by visual

Table 5. Vertebrate animal field survey areas (including surveys conducted to date)

Site #	Area	Surveys Conducted		
		Birds	Mammals	Herps
1	Gasline Road	X		X
2	Gasline Road	X		X
3	Muskrat Marsh	X		
4	Jones Island Road	X		
5	Jones Island Road	X		
6	Grubb Island Road	X		
7	Building 0800 Area	X		
8	Muskrat Marsh		X	X
9	Freels Bend Road	X		
10	Freels Bend Road	X		
11	Bull Bluff Road		X	X
12	Bull Bluff Road		X	X
13	Bull Bluff Road	X		
14	Bull Bluff Road	X		
15	Shepherd Cemetery		X	X
16	Shepherd Cemetery		X	X
17	McNew Hollow		X	X
18	Deer Check Station	X	X	X
19	Bear Creek		X	X
20	Flashlight Heaven Cave		X	X
21	Bearden Creek			X
22	Freels Bend	X		
23	Walker Branch	X		
24	Freels Bend		X	X
25	McNew Hollow		X	X
26	Deer Check Station		X	X

observation. Birding observations begin between 0600 and 0700 and continue until avian activity levels decrease (usually between 0900 and 1000). Fourteen sites have been sampled. Types of habitats sampled include: old field/grassland, hardwood forest, mixed pine/hardwood forest, and riparian. Birding will continue to be initiated in new areas of the reservation. However, old sites will be revisited as the seasons change. This survey scheme will accommodate the different species that migrate through or use the ORR during different seasons. Species found include: Scarlet tanager (*Piranga olivacea*), Summer tanager (*Piranga rubra*), Northern cardinal (*Cardinalis cardinalis*), Indigo bunting (*Passerina amoena*), American goldfinch (*Carduelis tristis*), Rufous-sided towhee (*Pipilo erythrophthalmus*), Field sparrow (*Spizella pusilla*), Chipping sparrow (*Spizella passerina*), Yellow billed-cuckoo (*Coccyzus americanus*), Great horned owl (*Bubo virginianus*), Barred owl (*Strix varia*), Ruby-throated hummingbird (*Archilochus colubris*), Belted kingfisher (*Ceryle alcyon*), Pileated woodpecker (*Dryocopus pileatus*), Red-bellied woodpecker (*Melanerpes carolinus*), Hairy woodpecker (*Picoides villosus*), Downy woodpecker (*Picoides pubescens*), Eastern kingbird (*Tyrannus tyrannus*), Eastern phoebe (*Sayornis phoebe*), Acadian flycatcher (*Empidonax virescens*), Barn swallow (*Hirundo rustica*), Cliff swallow (*Hirundo pyrrhonota*), Blue Jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), Tufted titmouse (*Parus bicolor*), Carolina wren (*Thryothorus ludovicianus*), House wren (*Troglodytes aedon*), Brown thrasher (*Toxostoma rufum*), Wood thrush (*Hylocichla mustelina*), Eastern bluebird (*Sialia sialis*), Blue-gray gnatcatcher (*Poliophtila caerulea*), Cedar waxwing (*Bombycilla cedrorum*), European starling (*Sturnus vulgaris*), Solitary vireo (*Vireo solitarius*), White-eyed vireo (*Vireo griseus*), Red-eyed vireo (*Vireo olivaceus*), Worm-eating warbler (*Helmitheros vermivorus*), Northern parula (*Parula americana*), Prairie warbler (*Dendroica discolor*), Hooded warbler (*Wilsonia citrina*), Eastern meadowlark (*Sternella magna*), Red-winged blackbird (*Agelaius phoeniceus*), Common grackle (*Quiscalus quicula*), Brown-headed cowbird (*Molothrus ater*), Canada Goose (*Branta canadensis*), Wood duck (*Aix sponsa*), Turkey vulture (*Cathartes aura*), **Black vulture** (*Coragyps atratus*), Red-tailed hawk (*Buteo jamaicensis*), **Red-shouldered hawk** (*Buteo lineatus*), **Osprey** (*Pandion haliaetus*), Wild turkey (*Meleagris gallopavo*), Northern bobwhite (*Colinus virginianus*), Great blue heron (*Ardea herodias*), Green heron (*Butorides striatus*), Common Flicker (*Colaptes auratus*), Mourning dove (*Zenaida macroura*), **Black-crowned night-heron** (*Nycticorax nycticorax*), Rough-winged swallow (*Stelgidopteryx ruficollis*), Pine warbler (*Dendroica pinus*), Louisiana waterthrush (*Seiurus motacilla*), **Red-headed woodpecker** (*Melanerpes erythrocephalus*), **Double-crested cormorant** (*Phalacrocorax carbo*), and **Bald eagle** (*Haliaeetus leucocephalus*). Table 6 summarizes the avian species observed on the ORR that are listed by State or Federal agencies.

3.3.2 Survey Summary for Mammalian Species

Small mammal trapping was conducted for 4 weeks. It has been suspended because capture success is low since natural food sources are abundant. Mammal sampling will resume in September when the temperature falls and available food resources diminish. Trapping sessions are conducted using Sherman mammal traps baited with a mixture of raw peanuts, oats, and birdseed. Three hundred traps are placed in two survey areas. Three 50-meter transects are placed in each area, and 50 traps are placed along each transect. Trap setting methods and trap location varied slightly between survey areas. These variations were to adapt to site differences and increase capture rates. Traps are checked for 3 consecutive nights per week and collected on the morning of the fourth day. Traps are opened in the evening, checked periodically throughout the night, and closed the following morning. Although checking the traps throughout the night is labor intensive, it reduced the possibility of animal mortality of the small mammals with high metabolic rates. Habitats sampled for mammals include: marsh area in mixed pine/hardwood forest, old field/grassland, and hardwood forest. Species captured include: Deer mouse (*Peromyscus maniculatus*),

**Table 6. Avian species observed on the Oak Ridge Reservation
that are listed by State or Federal agencies**

<u>Species</u>	<u>Common Name</u>	<u>Area</u>
<i>Buteo lineatus</i>	Red-Shouldered Hawk	Gasline Road
<i>Coragyps atratus</i>	Black Vulture	Gasline Road Freels Bend Deer Check Station
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Jones Island Road
<i>Melanerpes erythrocephalus</i>	Red-Headed Woodpecker	Bull Bluff
<i>Nycticorax nycticorax</i>	Black-Crowned Night Heron	Jones Island Freels Bend
<i>Pandion haliaetus</i>	Osprey	Poplar Creek

Golden mouse (*Peromyscus nuttalli*), White-footed mouse (*Peromyscus leucopus*), Short-tailed shrew (*Iarina brevicauda*) Eastern harvest mouse (*Reithrodontomys humulis*), Hispid cotton rat (*Sigmodon hispidus*), Pine vole (*Microtus pinetorum*), Meadow vole (*Microtus pennsylvanicus*), and Eastern chipmunk (*Tamias striatus*).

3.3.3 Survey Summary for Amphibian and Reptile Species

Several different capture methods are being employed to sample reptiles and amphibians. To date, 237 boards have been placed in various sites around the reservation to attract small mammals, reptiles, and amphibians. These boards provide shelter and food sources for the small mammals, amphibians, and small reptiles, which also attract larger reptiles. This method is a "voluntary" trapping method relying on animal preference for food and habitat. This method is also a passive method that requires minimal human participation. The boards are left in areas for extended periods and are checked weekly. The boards have been successful in attracting several animal species. Species attracted include: Five-lined skink (*Eumeces fasciatus*), Ground skink (*Leiopisma laterale*), Northern brown snake (*Storeria dekayi dekayi*), Eastern worm snake (*Carphophis amoenus amoenus*), Ringneck snake (*Diadophis punctatus*). Some small mammals have also been observed under the boards. Habitats containing boards include: grassland/old field, hardwood forest, marsh, mixed hardwood/pine forest, and around the mouth of a cave.

Four drift fences with pitfall traps have also been constructed in the woods, usually near a stream. Pitfall traps (5-gallon buckets with drain holes in the bottom) are placed alongside the fence. Therefore, animals that have their path obstructed by the fences will move along the fence until they fall into the trap. The pitfall traps are opened early in the morning and closed late in the afternoon. These structures capture small mammals as well as amphibians and reptiles. The pitfall traps have captured Eastern box turtles (*Terrapene carolina carolina*) and American toads (*Bufo americanus*).

Six hooptraps have also been placed in slow-moving bodies of water throughout the reservation to capture turtles. Traps are baited with sardines or fish-flavored cat food. The traps are opened at the beginning of the week and checked daily for captures. They are closed on the weekends. Eastern painted turtles (*Chrysemys picta picta*) and sliders (*Chrysemys scripta*) have been captured. Several turtles captured are Cumberland sliders (*Chrysemys scripta troosti*), which is a State-listed species. The Cumberland slider is a subspecies of the common Red-eared slider (*Chrysemys scripta elegans*) and is difficult to identify. Final identification is pending future meetings with herpetologists from the Tennessee Aquarium. Besides the various trapping methods employed, a considerable amount of reptile and amphibian sampling is done by looking under rocks and logs or searching in stream beds and caves. Several different species of amphibians and reptiles have been captured by this method. Species captured include: Woodland salamander (*Plethodon*), Eastern spadefoot toad (*Scaphiopus holbrooki holbrooki*), American toad (*Bufo americanus*), Gray tree frog (*Hyla chrysoscelis*), Green frog (*Rana clamitans melanota*), Slimy salamander (*Plethodon glutinosus glutinosus*), Cave salamander (*Eurycea lucifuga*), Southern Leopard frog (*Rana utricularia*), and Northern copperhead (*Agkistrodon contortrix mokasen*). Sampling for reptiles and amphibians will continue until mid-fall when their activity declines. Surveying will be resumed for these species when the weather warms.

3.4 DOCUMENTATION

Data for each surveyed area will be prepared and entered into OREIS. Currently, data are entered into data sheets, transferred onto maps, and entered into a FoxPro database. Monthly summary reports are developed to provide a summary of on-going activities.

3.5 PLANNED WORK

Field surveys will continue through December of 1995. Compilation of data and reporting will be completed in February of 1996.

APPENDIX A

Letter Reports of Findings from Vascular Plant Surveys of the Oak Ridge Reservation
(July 1993 - September 1994)

Bear Creek Operable Unit
Chestnut Ridge Operable Units 1 - 4
Compartment 1
Compartment 1 Update
Compartment 1 Update (2)
Compartment 3
Compartment 5
Compartment 6
Compartment 6 Update
Compartment 7
Compartment 8
Compartment 9
Compartment 10
Compartment 28
Compartment 28 Update
Freels Bend Operable Unit
K-25 Groundwater Operable Unit
Melton Valley Groundwater Operable Unit
Research Parck Natural Area 7
Research Parck Natural Area 8
Research Parck Natural Area 11
Research Parck Natural Area 25
Research Parck Natural Area 26
Research Parck Natural Area 27
Research Parck Natural Area 29
South Campus Facility Operable Unit
Upper East Fork Creek Operable Unit

The location of each site is identified on one of the following maps:

- 1) Environmental Restoration Program Operable Units on the Oak Ridge Reservation
- 2) DOE Oak Ridge Reservation Compartment Map
- 3) Research Park Natural Area and Reference Area Map

OAK RIDGE RESERVATION
ENVIRONMENTAL RESTORATION OPERABLE UNITS (OU's)

DOE Oak Ridge Reservation Compartment Map

LEGEND

1st Class roads	Creeks and shoreline
2nd Class roads	DOE Boundary
3rd Class roads	Reference Area
4th Class roads	Natural Area
Trails	Aquatic Natural Area
Transmission lines	Aquatic Reference Area

Oak Ridge Administrative Grid Coordinate System

Source: Base map data from TVA 6-16A database.
Thematic Data:
Environmentally Sensitive Areas database Ver. 1.0
from Oak Ridge National Research Park.

Prepared by ORES, Environmental Restoration Division
Martin Marietta Energy Systems

Map Composition Date: Aug. 3, 1993

Scale - 1:85,000

LTR.#PIA-TO/93-158

TIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

November 12, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Bear Creek Operable Unit

On September 12, 1993, Mr. Larry Pounds and Ms. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the Bear Creek Operable Unit (OU). Four state-listed species and one species under consideration for state listing were found during the survey. Results from the survey of the Bear Creek OU are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
J. T. Grumski
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr
cc: Sharon Conder, Barbara Rosensteel

November 10, 1993
Subject: Bear Creek OU

This completes the plant survey reports for the OU areas on the ORR.

Plant survey area: **Bear Creek OU**

Botanist/surveyor: Larry R. Pounds and Rebecca Cook, The University of Tennessee

Field survey dates: 1993 July 18, 29; August 3, 4, 13, 18, 19, 20; September 9, 12.

Status: entire area has been surveyed.

Results: four state-listed species occur on the site, and one species is under consideration for listing. No federally listed species or species under consideration for federal listing were found.

Note: Locations are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know only basis.

Report prepared by: P. D. Parr, ESD.

General description: The Bear Creek OU runs from the Y-12 fenced areas to Highway 95 and includes Bear Creek Valley, a little of the north slope of Chestnut Ridge, and the entire south slope of Pine Ridge.

1) The south slope of Pine Ridge is generally oak forest. The east side of the only major gap in Pine Ridge (along Gum Hollow Rd.) is a Research Park Reference Area (RA15). RA15 has an unusual plant community (for the ORR) of beech trees with a mountain laurel understory. Pink Lady's Slipper (State, "Endangered") most likely occurs throughout this section in the dry forests. There are a number of tributaries of Bear Creek that cut into the south slope of Pine ridge. Several of these have wetlands along them north of the utility rights-of-way (shown as a broken line on the map). Platanthera flava var. herbiola (State, "Threatened") is found in some of these wetlands. These sites are included in the Research Park Natural Areas 13 and 28 (NA13, NA28). Isoetes caroliniana occurs in Research Park Reference Area 5 (RA5) and is a species that is under consideration for listing by the state.

2) The utility R-O-W has wetlands on it. The state listed species, Platanthera peramoena, is found in two of these R-O-W wetlands. The R-O-W has a good variety of native plant species. This is different from many of the R-O-W areas that are dominated by alien species. The haul road has disturbed some of this R-O-W plant community. The site for Lilium canadense (State, "Threatened") was probably destroyed by the construction of the haul road.

3) Between the R-O-W and Bear Creek Rd. there is little habitat for rare plants. There is a landfill, some buildings, and forested area (much of it in pine plantation). There are wetlands in this area, but no rare plants have been found.

4) The north slope of Chestnut Ridge slope is south of the R-O-W and Bear Creek Rd. The slope is wooded (deciduous forest with some areas of white pine). There are outcrops of limestone. Research Park Reference Area 7 (RA7) is an area of white pines which includes a large spring, with some wetland area in the valley. Ginseng, Panax quinquefolius, has been found scattered throughout the north slope of Chestnut Ridge.

Rare plants of the Bear Creek OU

Ginseng, Panax quinquefolius. State, "Threatened". Six sites are marked on the map (Pq). More sites likely occur since this species is scattered throughout forested areas. Ginseng is not rare on the ORR but in general is threatened by over-harvesting. Other locations in the Bear Creek OU are very likely. Illegal ginseng harvesting does occur on the ORR.

Canada Lily, Lilium canadense. State, "Threatened". This species was found in the past at approximately the location marked "Lc" on the map. It has not been seen recently in the OU and was likely destroyed when the haul road was constructed (we were not consulted on that road). This showy species, when in bloom, is in danger from digging for home gardens and some locations on the ORR where the Canada lily was previously known no longer have the lily.

Pink Lady's slipper, Cypridedium acaule. State, "Endangered". Three sites were found and are marked on the map as "Ca". More sites likely occur along the south facing slope of Pine Ridge. This plant is widely distributed on the reservation in dry, non-calcareous forests, especially with pine trees (however, not in pine plantations). It is state listed due to being dug for home gardens (where it is rarely successfully grown).

Tubercled rein-orchid, Platanthera flava var. herbiola. State, "Threatened". This is a shaded wetland orchid. It's found at four sites in the Bear Creek OU. It is known only to occur in the Bear Creek drainage on the ORR.

Purple fringeless orchid, Platanthera peramoena. State, "Threatened". This orchid is most common in wet meadow sites. It occurs in the Bear Creek OU in two sites (Pp on map) on the utility R-O-W.

Carolina quillwort, Isoetes carolinia. This is a species with potential for state and federal listing. It is found in the wetland Research Park Reference Area 5 (RA5). It likely occurs also in Research Park Natural Area 13 (NA13). The quillworts in NA13 have not yet been identified/verified by a specialist.

IAF MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831
September 8, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and endangered plant species survey of Chestnut Ridge Operable Units 1, 2, 3, and 4

On July 17, 1993, Mr. Larry Pounds, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Chestnut Ridge (CR) Operable Units (OUs) 1, 2, 3, and 4. CR OUs 1, 2, 3, and part of 4 were surveyed in 1991 as part of a Y-12 project and were not revisited this year. CR OU 4 was visually surveyed on July 17, 1993. Results from the surveys of CR OUs 1, 2, 3, and 4 are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK

Enclosure

cc/enc: D. T. Bell
M. F. P. DeLozier
J. T. Grumski
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr

Date: August 27, 1993
Subject: CR OU 1,2,3,4

Plant survey area: **CR OU 1,2,3,4**

Botanist: Larry R. Pounds, The University of Tennessee

Field survey dates: 1993 July 17.

Status: Entire area has been surveyed.

Results: One state-listed plant species in CR OU **2**. ^{ADK}

Note: Locations of species and areas discussed are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: P. D. Parr, ESD.

General description: CR OU 1,2, 3, and part of 4 were surveyed in 1991 as part of a Y-12 project. They were not re-visited this year. Findings from that report are included in this report. The 1991 report that includes CR OU 1, 2, and 3 is attached. In the 1991 report, CR OU 2 is referred to as "A" and "B". The part of CR OU 4 previously surveyed is referred to as "C".

CR OU 1 and 3 have no natural vegetation and, therefore, no rare plant habitat.

CR OU 2 includes the old Y-12 Ash Disposal area and McCoy Branch from the Ash Disposal Area to the Quarry Area. The Ash Disposal area is within a Research Park Reference Area (RA 27). The area was designated a Reference Area due to the unusual nature of the disturbance. The substrate here is ash which would not be found in nature, however rare plants have been found here. There is great research potential.

CR OU 1, 2, 3, and 4 continued

CR OU 4 includes the quarry area. It was surveyed by looking through the fence. It is possible there may be rare plants in the quarry area, but security and safety reasons make it difficult to look more closely. A more detailed survey could be arranged if there were specific project plans that would disturb potential habitats. McCoy Branch flows south from Bethel Valley road to an embayment of Melton Hill Lake. There is little wetland development until the stream reaches the embayment. The stream flows through field areas. Reed Canary Grass (Phalaris arundinacea) dominates the banks of the stream. This is the first record for this grass on the Oak Ridge Reservation. This grass is more common to the north and was perhaps planted here or recently brought to the area by waterfowl. A natural area (McCoy Branch Embayment Barrens Natural Area -NA 8) is in an upland area just to the east of this section of McCoy Branch.

map attachment

cc: Barbara Rosensteel

October 18, 1991

Cory Wilkinson, Bldg. 9115, MS-8219, Y-12

RESULTS OF THE Y-12 OLD ASH DISPOSAL AREA SURVEY

A rare plant and wetland survey was requested for the Y-12 Old Ash Disposal Area and its downstream drainage, as part of a general Y-12 survey. This part of the survey was conducted by Larry Pounds and Rebecca Cook from July to September, 1991.

HABITAT DESCRIPTION

Due to the complexity of the area involved, the surveyed area was divided into three sites (see map) for description purposes.

Site A: Earthen dam and ash-filled area.

The earthen dam itself was covered with Kudzu (*Pueraria lobata*). Directly behind the dam, a wooded area had become established on the fly ash substrate. Cottonwood (*Populus deltoides*) was dominant in the overstory and Box elder (*Acer negundo*) abundant in the understory. Nepal microstegium (*Microstegium vimineum*) was the dominant groundcover. An Alder (*Alnus serrulata*) thicket occurred just north of the cottonwood stand. Lesser ladies-tresses orchid (*Spiranthes ovalis*) was found growing in this thicket. This was an unusual find, as this plant usually occurs in drier habitats.

Continuing north from the alder thicket (see map), the area became more open. The vegetation was dominated by a grass, Joint-headed arthraxon (*Arthraxon hispidus*). Horsetails (*Equisetum sp.*), Sedges (*Carex sp.*), and Rushes (*Juncus sp.*) also occurred. Scattered Willows (*Salix sp.*) and some Alders were found throughout the area and along a well-defined stream course to the east side of the ash fill. The stream course was apparently a continuation of an existing natural stream that enters the ash fill area further up the valley. Its flow appeared to be intermittent at the time of this survey. A less well-defined stream course was also observed on the west side of the ash fill area.

A small pond was found in the northwest corner of the valley (see map). Its water level dropped to just below the surface during the course of this survey. A floating aquatic

species, Larger water-starwort (*Callitriche heterophylla*) dominated the vegetation on the pond. A larger pond was also found in the northeast corner of the area (see map). Cattails (*Typha latifolia*) and Sedges surrounded the edge of this pond and Leafy pondweed (*Potamogeton foliosus*) dominated vegetation on the pond surface.

Site B. Down Stream Area

Immediately below the earthen dam, Kudzu continued to dominate the vegetation. Continuing south along the stream course (see map), mixed deciduous forest vegetation became dominant. The banks of the stream were forested until just north of Roger's Quarry, where area opened up for about a quarter of an acre (see map). There was evidence of significant past disturbance at this site. Black willow (*Salix nigra*) and cattail dominated the vegetation along both sides of the stream. Winged loosestrife (*Lythrum alatum*) also was found here, which represents the only known site on the Oak Ridge Reservation for this particular species.

Site C. Roger's Quarry Area

This area was viewed from just outside an existing fence, because the surveyors did not have access to the area at the time of the survey. The quarry had very steep banks with many areas of bare rock. Red cedar (*Juniperus virginiana*) occurred sporadically throughout this area. The quarry contained a deep pond that had embankments too steep to support any significant vegetation communities along its edge.

RARE PLANTS PRESENT

About ten Lesser ladies-tresses orchids were found on site A (see site description and map). This inconspicuous orchid is classified by the State of Tennessee as a Species of Special Concern, but may be more abundant than previously thought. It is not a federally listed species.

WETLANDS PRESENT

Site A. The two ponds located in the northeast and northwest corners of the site (see site description and map) do meet the wetland requirements established by the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (U.S. Federal Interagency Cooperative Publication, January 1989). There was standing water at both locations for over a month during the time of the survey. The vegetation present (see Appendix I) was dominated by Obligate and Facultative Wetland species (see Appendix II for explanation of terms).

The rest of the fly ash fill area represents an unique situation. The vegetation present (see site description and Appendix I) was dominated by Obligate and Facultative Wetland species and water was present at or near the surface for the duration of the survey. Fly ash, however, is not considered a wetland soil. Water flow into the ash fill area has also decreased due to recent rerouting activities. How significantly the area's hydrology will change is uncertain at this time. As a result of these factors, it is unclear whether this area should be classified as a jurisdictional wetland.

Site B. The open area just north of Roger's Quarry meets the requirements for a jurisdictional wetland. The vegetation was dominated by Obligate and Facultative Wetland species (see site description and Appendix I). The .25 acre area had standing water and water just at the surface throughout the time of this survey.

Site C. There were no wetlands present at this site.

If you have any questions, please feel free to call me.

A handwritten signature in cursive script, reading "Carol L. Hardy". The signature is written in dark ink and is positioned above the typed name and title.

Carol L. Hardy, Coordinator, Rare Plant and Wetland Surveys, Environmental Sciences Division, Bldg. 1506, MS-6034, (6-7544)

enclosure

cc: Don Ainley, Bldg. 9739, MS-8209, Y-12
Mick Wiest, Bldg. 9116, MS-8098, Y-12

APPENDIX I. Mid to late summer abundant vegetation of the Old Ash Disposal Area and down stream drainage, Oak Ridge Reservation, Oak Ridge, TN.

Site	Species Name	Wetland Classification ^{1,2}
Site A		
Earthen Dam	<i>Pueraria lobata</i>	No Classification
Wooded Area	<i>Acer negundo</i>	FACW
	<i>Microstegium vimineum</i>	FAC, FACW
	<i>Populus deltoides</i>	FAC+, FACW
	<i>Spiranthes ovalis</i>	FAC
Alder Thicket	<i>Alnus serrulata</i>	FAC+, FACW
Open Ash-fill Area	<i>Arthraxon hispidus</i>	FAC+, FACW
	<i>Carex sp.</i>	OBL, FACW, FAC
	<i>Equisetum sp.</i>	FACW, FAC+
	<i>Juncus sp.</i>	OBL, FACW
	<i>Salix sp.</i>	OBL, FACW
Northwest Pond	<i>Callitriche heterophylla</i>	OBL
Northeast Pond	<i>Potamogeton foliosus</i>	OBL
	<i>Typha latifolia</i>	OBL
Site B		
Down Stream Area	<i>Salix nigra</i>	OBL
	<i>Typha latifolia</i>	OBL
	<i>Lythrum alatum</i>	FACW+, OBL
Site C		
Roger's Quarry Area	<i>Juniperus virginiana</i>	FACU-, FACU

1. National List of Plant Species That Occur in Wetlands: Tennessee. May 1988
Biological Report, Reed Porter Jr., U.S. Fish and Wildlife Service. NERC-88/18.42.

2. See Appendix II for explanation of symbols.

LTR.#PIA-TO/93-147

M. N MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

October 22, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 1 Area

During the month of October 1993, the east section of the Compartment 1 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the section that was surveyed. Results from the survey of the east section of the Compartment 1 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: October 20, 1993
Subject: Compartment 1 East/ Pine Beetles

Compartment 1 has been separated into three areas for the purposes of the rare plant surveys and Stream Management Zone designations. These areas are designated East, Middle, and West. This is the report for Compartment 1 East. The areas in Compartment 1 East that need to be cut due to the pine beetle infestation have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 1 East is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 1 East Summary:

There is a blue heron rookery adjacent to area C1E-25 and part of that area should not be logged. There is a Research Park Reference Area near area C1E-32 and care should be taken to not disturb that site.

There is one main stream in the East area, but does not appear to be in the area marked for present or future logging of pines. The location of the stream is marked on the compartment map, however, due to differences in scale and lack of topographic contours on the compartment map, the locations are approximate. The upstream reaches of the stream are intermittent and, due to some extent to the drought this year, were carrying no flow on the day of the survey.

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Compartment 1 East: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C1E-22	none	none	OK	
C1E-23	none	none	OK	
C1E-24	none	none	OK	
C1E-25	none	none	partial	There is a blue heron rookery (Research Park Reference Area 23 adjacent and part of C1E-25 should not be logged to avoid disturbance to it.
C1E-26	none	none	OK	
C1E-27	none	none	OK	
C1E-28	none	none	OK	
C1E-29	none	none	OK	
C1E-30	none	none	OK	
C1E-31	none	none	OK	
C1E-32	none	none	OK	There is a Reference Area (RA2) nearby, don't disturb it.
C1E-33	none	none	OK	

LTR.#PIA-TO/93-150

M N MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

November 3, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Update on the Threatened and Endangered Plant Species Survey of the Compartment 1 Area

During the month of October 1993, the west section of the Compartment 1 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the section that was surveyed. Results from the survey of the west section of the Compartment 1 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: October 26, 1993
Subject: Compartment 1 West/ Pine Beetles

Compartment 1 has been separated into three areas for the purposes of the rare plant surveys and Stream Management Zone designations. These areas are designated East, Middle, and West. This is the report for Compartment 1 West. The areas in Compartment 1 West that need to be cut due to the pine beetle infestation have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 1 West is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 1 West Summary:

The southern portions of C1W-1 and C1W-2 should not be cut due to potential habitat for rare plants and animals, and adjacent wetlands.

Barbara Rosensteel and Don Todd surveyed the West area of compartment 1 on October 20, 1993 to determine if buffers needed to be established around any of the streams or wetlands. There are no streams or wetlands in C1W-1 through C1W-6, however, loblolly pine plantations adjacent to C1W-1 and C1W-2 are near or adjacent to wetlands and to the Clinch River.

Logging activities in the 2-acre loblolly pine plantation adjacent to C1W-1 (see map) should not extend to the south of Raby Road because this area does not contain pines and could be wet at some times of the year. It also provides a good buffer between the logging and the Clinch River. The area was not flagged in the field because it is shown and marked on the compartment map and is clearly evident on the ground.

The area south of Raby Road and immediately west of the 8-acre loblolly pine plantation (1974) is a low-elevation, level bottomland dominated by sycamore, green ash, privet, and silky dogwood. The soil in this area was moist and there was water within 15 inches of the surface. Orange flagging was used to mark a short line at the break between the pine

plantation and this bottomland. Logging equipment should not go beyond this flagging. This pine plantation also borders a small embayment of the Clinch River that contains both open water and wetlands. There is a narrow (20-30 foot) band of hardwoods, shrubs, vines, and herbaceous vegetation separating the pine plantation from the river and wetland. There are also emergent wetlands along the river shore. If this pine plantation is logged, care must be taken to eliminate the possibility of erosion of soil into this narrow band of hardwood vegetation and into the wetlands, and subsequently, into the river. BMP's such as silt fences and straw bales should be installed along the edge of the plantation next to the river. The silt fences should not be allowed to remain in place indefinitely after logging activities are completed. They should be removed from the site after the soil is stabilized. Under no circumstances should any logging equipment or downed trees enter the narrow, natural vegetated buffer along the river.

The area (marked on the map) in C1W-2 contains rocky sinkholes. It includes cave entrances that provide potential habitat for rare wildlife and plants. Do not log in this area.

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Compartment 1 West: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C1W-1	none	none	partial	Do not cut area south of Raby Road marked on map. Wetland area.
C1W-2	possible	some	partial	Do not cut or disturb area marked on map- there are some wetland areas and potential rare plant and animal habitats. Also borders Natural Area 19 (NA19) where rare plants occur.
C1W-3	none	none	OK	
C1W-4	none	none	OK	
C1W-5	none	none	OK	
C1W-6	none	none	OK	
C1W-7	none	none	OK	

LTR.#PIA-TO/93-155

MARTIN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

November 10, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Update on the Threatened and Endangered Plant Species Survey of the Compartment 1 Area

During the month of November 1993, the middle section of the Compartment 1 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the section that was surveyed. However, there are several locations within this section that may contain rare plants that are evident during other seasons. Results from the survey of the middle section of the Compartment 1 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: November 3, 1993
Subject: Compartment 1 Middle/ Pine Beetles

Compartment 1 has been separated into three areas for the purposes of the rare plant surveys and Stream Management Zone designations. These areas are designated East, Middle, and West. This is the report for Compartment 1 Middle. The areas in Compartment 1 Middle that need to be cut due to the pine beetle infestation have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 1 Middle is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 1 Middle Summary:

Areas marked 2-9, 18, and 20 in Compartment 1 Middle should not be cut. It is difficult to determine the possible occurrence of rare plants this time of year (they are not visible). These areas are of mixed hardwood and pine, often with little pine. There is potential for rare plants here because: 1) there are few alien species and this indicates low disturbance, and 2) two species not previously recorded as occurring on the ORR were recently found in this type of community during the growing season.

Compartment 1 Middle has been field checked for the presence of streams in pine plantations and areas marked for logging. There are two streams in the Compartment 1 Middle area. The locations of these streams are marked on the compartment map, however, due to differences in scale and lack of topographic contours on the compartment map, the locations are approximate. The upstream reaches of these streams are intermittent (not visible at all times) and, due to some extent to the drought this year, were carrying no flow on the day of the survey. The streams were not marked in the field since they do not appear to be in the areas designated for present or future logging.

Compartment 1 Middle: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C1M-1	none	none	OK	
C1M-2	possible	none	NO	DO NOT CUT.
C1M-3	possible	none	NO	DO NOT CUT.
C1M-4	possible	none	NO	DO NOT CUT.
C1M-5	possible	none	NO	DO NOT CUT.
C1M-6	possible	none	NO	DO NOT CUT.
C1M-7	possible	none	NO	DO NOT CUT.
C1M-8	possible	none	NO	DO NOT CUT.
C1M-9	possible	none	NO	DO NOT CUT.
C1M-10	none	none	OK	
C1M-11	none	none	OK	
C1M-12	none	none	OK	
C1M-13	none	none	OK	
C1M-14	none	none	OK	
C1M-15	none	none	OK	
C1M-16	none	none	OK	
C1M-17	none	none	OK	

continued - Compartment 1 Middle: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C1M-18	possibly	none	NO	Possible habitat, can't tell this time of year. Do not cut.
C1M-19	none	none	OK	
C1M-20	possibly	none	NO	This is a Reference Area (RA18). Do not cut.
C1M-21	none	none	OK	

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

December 3, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 3 Area

During the month of November 1993, the Compartment 3 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the area that was surveyed. However, there are several locations within this area that may contain rare plants that are evident during other seasons. Results from the survey of the Compartment 3 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: November 30, 1993
Subject: Compartment 3/ Pine Beetles

The areas in Compartment 3 that need to be cut due to the pine beetle infestation have been checked with respect to possible impacts on potential rare plant habitats (since the actual plants are not visible during the winter) streams, and wetlands.

A table with specific comments for Compartment 3 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 3 Summary:

No rare plants were seen, however potential habitats exist in Compartment 3 and these have been noted in the table.

Wetlands and stream management zones occur in some of the areas. Some of these have been marked, some have not.

The following areas are listed as okay to cut but for which it will be necessary to mark the stream and wetland buffers: C3-14, 15, 16, 17, 25, 26, 32, 36, 45. These are shown on the map. Contact Barbara Rosensteel (6-2372) at least a week prior to cutting in these areas so she can coordinate marking the buffers.

The following areas may be cut, but have stream management zones marked in them: C3-31, 37, 34 and 35. Some may require additional flagging along tributaries. Contact Barbara Rosensteel (6-2372).

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Compartment 3: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C3-1	none	none	OK	
C3-2	none	none	OK	
C3-3	none	none	NO.	Don't cut. Natural pine mixed with hardwoods.
C3-4	none	none	OK	
C3-5	none	none	OK	
C3-6	none	none	OK	
C3-7	none	none	NO.	Don't cut. Mixed hardwood.
C3-8	none	none	OK	
C3-9	none	none	NO.	Natural pine. Don't cut.
C3-10	none	none	OK	
C3-11	none	none	OK	
C3-12	none	none	OK	
C3-13	none	none	OK	
C3-14	none	none	OK	- But stream buffer is not yet marked. Contact Barbara Rosensteel at least 1 week prior to initiating cutting. 6-2372.

continued, Compartment 3: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C3-15	none	none	OK	- But stream buffer is not yet marked. Contact Barbara Rosensteel at least 1 week prior to initiating cutting. 6-2372.
C3-16	none	none	OK	- But stream buffer is not yet marked. Contact Barbara Rosensteel at least 1 week prior to initiating cutting. 6-2372.
C3-17	none	none	OK	- But stream buffer is not yet marked. Contact Barbara Rosensteel at least 1 week prior to initiating cutting. 6-2372.
C3-18	none	none	OK	
C3-19	partial	none	No	- don't cut.
C3-20	none	none	OK	
C3-21	potential	none	NO.	Natural stand. Don't cut.
C3-22	none	none	NO.	Natural stand. Don't cut.
C3-23	potential	none	NO.	Natural stand. Don't cut.
C3-24	potential	none	NO.	Natural stand. Don't cut.

continued, Compartment 3: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C3-25	none	yes		OK. Stream buffer is not yet marked. Contact Barbara Rosensteel at least 1 week prior to initiating cutting in this area, 6-2372.
C3-26	none	yes		OK - But stream buffer is not yet marked, Contact Barbara Rosensteel at least 1 week prior to initiating cutting in this area, 6-2372.
C3-27	potential	yes		NO. Do not cut.
C3-28	none	yes		NO. Do not cut.
C3-29	none	yes		NO. Don't cut. Now hardwood dominated.
C3-30	potential	none		NO. Don't cut.
C3-31	none	yes		OK - stream buffers have been flagged in this area.
C3-32	none	yes		OK - but stream buffers have not been flagged. Contact Barbara Rosensteel at least 1 week prior to initiating cutting, 6-2372.
C3-33	potential	none		NO. Natural stand.

continued, Compartment 3: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C3-34	possibly	yes		Partial. Buffers near the creek are partially flagged. Stay out of cedars along the southwest side and don't use that area for laydown.
C3-35	none	yes		NO. Don't cut. Partially flagged.
C3-36	none	yes		OK - but stream buffers have not been flagged. Contact Barbara Rosensteel at least 1 week prior to initiating cutting, 6-2372.
C3-37	none	yes		NO - Don't cut.
C3-38	none	none		OK
C3-39	none	none		NO. Pines are already dead. Hardwood regeneration already started.
C3-40	none	none		OK
C3-41	potential	none		NO. Natural stand. Don't cut.
C3-42	potential	none		NO. Natural stand. Don't cut.
C3-43	none	yes		No. Don't cut.
C3-44	none	none		OK

continued, Compartment 3: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C3-45	none	none	OK	- but most of the large pines are already dead. Stream on west side will need to be flagged. Contact Rosensteel, 6-2372.
C3-46	none	none	NO.	Natural pine. Don't cut.
C3-47	none	none	OK	
C3-48	none	none	OK	
C3-49	potential	none	NO.	Natural stand. Do not cut.
C3-50	none	none	OK	
C3-51	potential	yes	NO.	Do not cut.
C3-52	this stand is no longer there			

MARTIN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

February 16, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of the Compartment 5 Area

During the month of February 1994, the Compartment 5 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the area that was surveyed. However, there are several locations within this area that may contain rare plants that are evident during other seasons. Results from the survey of the Compartment 5 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Projects Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
C. A. Gabrielsen
E. L. Hannahs
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC
File-SRC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Barbara Rosensteel

Date: February 9, 1994
Subject: Compartment 5/Pine Beetles

The areas in Compartment 5 that are mapped as pine plantations or natural pine (mixed pine/hardwood) have been surveyed in the field with respect to possible impacts on potential rare plant habitats (since the actual plants are not visible during the winter) and given a preliminary review in the office to determine where Stream Management Zones (SMZ) and wetland buffers may need to be established. Please contact me at least a week before you intend to log the stands for which SMZs are indicated so that we can mark them in the field.

A table with specific comments for Compartment 5 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 5 Summary:

It was not possible to identify any rare plants due to the time of year. However, potential rare plant habitat exist in areas mapped as natural pine in which hardwoods predominate.

There is known rare plant habitat within the east-west utility corridor. This area has been designated a Natural Area. There is also no existing road along this utility corridor, and, therefore, no road crossings of the numerous streams that cross the corridor. For these reasons, the utility corridor should not be used as an access route for any of the stands. There are 3 stands north of the utility corridor that you may wish to access. These should only be accessed by temporary roads that 1) are started from plantations on the south side of the corridor that are marked for logging, 2) which run perpendicular to the corridor, and 3) are located on the tops of the hills. The specific stands for which this limitation applies are addressed in the Notes section.

There are streams and stream-associated wetlands in Compartment 5. SMZs will need to be established around all the streams and wetlands prior to logging. Stands in which SMZs are needed have been indicated in the "notes" section. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Distribution:

Helen Braunstein, 130MIT, MS-6282
Greg Byrd, 7500, MS-6381
Amy King, 101MID, MS-6481
Frank Kornegay, 4500N, MS-6198
Pat Parr, 1506, MS-6034
Jim Rogers, K-1001, MS-7155
Bonnie Shoemaker, 0303-8, MS-7314

Dave Shriner, 1505, MS-6038
Bill Thompson, K0303-7, MS-7328

Compartment 5 : Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C5-1	none	no	<u>Yes</u>	This stand may be accessed only from Area 3. Powerline corridor should be crossed perpendicular to the corridor and only at the top of the hill.
C5-2	none	yes	<u>Yes</u>	SMZ is needed along northwestern edge.
C5-3	none	yes	<u>Yes</u>	SMZ needed along eastern edge..
C5-4	none		<u>No</u>	There is a drainage channel located in this small stand which connects with wetlands and a Clinch River backwater area. The stand also has wetlands on it's eastern and western edges and hydric soils within the stand (indicating seasonal soil saturation). This area should not be logged.
C5-5	none	yes	<u>Yes</u>	There are wetlands to the northeast (in the powerline corridor) and north of this stand. A wetland buffer has been flagged which leaves the southern corner of this stand open to logging. The areas that have been flagged off can be very wet and no equipment or logging activities should enter beyond the flags.
C5-6	none	no	<u>No</u>	This stand has succeeded to a hardwood-dominated community. There are a few scattered loblolly pines. This area is surrounded by a large hardwood forest, except for the west in which there are powerline corridors, roads, and small pine stands already SPB-infested. Therefore, potential SPB spread from this area is unlikely to contribute to any further infestations.
C5-7	none	yes	<u>Yes</u>	Parts of this area may be logged, if necessary. SMZs are needed for the wetlands and waters to the east and south. There is an old, overgrown road from the north that may be used to access this area. Do not access through area 19 because it is likely that there are wetlands in that area.

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C5-8	none	yes	<u>Yes</u>	SMZ may be needed if edge of stand is near the K1515 Lagoon.
C5-9	none	yes	<u>Yes</u>	SMZ will be needed for a seasonal tributary that runs through part of this area.
C5-10	none	no	<u>Yes</u>	
C5-11	none	no	<u>No</u>	This stand is dominated by white pine. With few exceptions located on the northeastern side of the area, the pines did not appear to be infested with the SPB. These exceptions are located next to an infested loblolly plantation (area 9). Consider cutting buffer to protect the rest of the stand, but do not cut the remaining white pine stand if not infested. The edges of these areas are covered with kudzu and removal of interior canopy species may encourage the even more rapid growth of kudzu over the area and into new areas.
C5-12	none	no	<u>Yes</u>	
C5-13	none	no	<u>Yes</u>	
C5-14	none	yes	<u>Yes</u>	SMZ will be needed along western edge. If it is necessary to log this stand it may be accessed only from area 15, with the temporary road to cut straight across the powerline corridor on top of the hill.
C5-15	none	yes	<u>Yes</u>	SMZ will be needed along western and part of eastern edge of stand.
C5-16	none	yes	<u>Yes</u>	This area is mapped as a clearcut. The area is now dominated by immature loblollies that have regrown since the area was clearcut (or were replanted?) If it is necessary to cut pines here, an SMZ will be needed at the stream that flows through the area.

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C5-17	none	yes	<u>Yes</u>	Needs SMZ.
C5-18	none	yes	<u>Yes</u>	Needs SMZs. Access to this stand should be from Water Tank Road. If not possible, then access across the utility corridor must be restricted to the top of the hill and perpendicular to the corridor.
C5-19	potential		<u>No</u>	The topography of this area is dissected by several tributaries and subtributaries. There are steep slopes. This area is dominated by hardwoods with pines, some of which are dead, scattered throughout. Potential rare plant habitat.
C5-20	potential		<u>No</u>	Area dominated by hardwoods with scattered pines. Potential rare plant habitat. In addition, access to this area, without damaging known rare plant habitat or cutting new roads through the hardwood area to the south,, is questionable.
C5-21	potential		<u>No</u>	Natural pine stand.
C5-22	potential		<u>No</u>	Natural pine stand.
C5-23	potential		<u>No</u>	Natural pine stand.

LTR.#PIA-TO/93-123

M. IN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 27, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Survey of the Compartment 6 Area

During the month of September 1993, sections of the Compartment 6 area were surveyed for potential impacts on rare plants and wetlands due to the removal of pine trees from this area. No rare plants were found in the sections that were surveyed, however, a rare walnut tree species may exist in a nearby compartment. Results from the surveys of the Compartment 6 area of K-25 are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

To: Dennis Bradburn
From: Pat Parr

Date: September 22, 1993
Subject: Compartment 6/ Pine Beetles

MARTIN MARIETTA ENERGY SYSTEMS, INC.

This memo addresses only the areas originally requested to be looked at in Compartment 6 (see attached map). The rest of the pine areas in Compartment 6 will still need to be surveyed. The areas in Compartment 6 originally requested for surveying have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 6 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 6 Summary:

There are no rare plants known to occur in the Compartment 6 areas marked to be cut. However, there are three small trees within C-6-I4 that may be a rare species of walnut. It will be difficult to confirm for a while. They have been flagged- please don't cut them. Also, there are some sites near the areas to be cut that have been marked with flagging. Please make sure that there is no disturbance in those areas.

Research Park Reference Area 17 (RA17) occurs at the northern portion of Compartment 6 adjacent to C-6-I6. Please avoid disturbance (no heavy equipment or cutting) within the Reference Area.

Upper Mitchell Branch is within C-6-I3. This stream is used for the K-25 Biological Monitoring and Abatement Program and care will need to be taken to ensure that it is not impacted. John Smith (6-4163) has marked a buffer area approximately 30 meters from the stream. Do not allow heavy equipment within the buffer area. His memo is attached and states that there are some dead pine within the buffer area. He is not opposed to having some of these trees cut as long as they are left where they fall and disturbance to surrounding hardwoods and underbrush is minimal. There should be no kind of disturbance that would allow an increase in the amount of silt/sediment entering the stream. Please call him if there are any questions regarding the buffer along Upper Mitchell Branch.

Note, also, that Compartment 6 map does not accurately show the main channel location of Mitchell Branch. The attached map from John Smith has the main channel identified with the buffer area marked.

Compartment 6, originally requested areas, page 2

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Distribution:

Helen Braunstein, 130MIT, MS-6282
Amy King, 101MID, MS-6481
Frank Kornegay, 4500N, MS-6198
Jim Loar, 1504, MS-6351
Jim Rogers, K-1001, MS-7155
Barbara Rosensteel, 1503, MS-6034
Mike Ryon, 1504, MS-6351
Beth Schilling, 1504, MS-6351
Bonnie Shoemaker, 0303-8, MS-7314
Dave Shriner, 1505, MS-6038
John Smith, 1505, MS-6038

Attachments: map and memo

Compartment 6: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C-6-I1	none	none	OK	
C-6-I2	none	none	OK	
C-6-I3	none	none	OK	Upper Mitchell Branch is here. Note attached map from John Smith, 6-4163. A buffer has been marked approximately 30 m from stream. Do not disturb inside buffer.
C-6-I4	maybe	yes	OK	There are three, small trees here that may be a rare species of walnut. These have been flagged. It is difficult to make an accurate species determination on them right now. Please do not disturb the marked trees.
C-6-I-5	none	none	OK	There is no problem cutting where marked on the map. There are wetlands and a Research Park Reference Area stream nearby (ARA1).
C-6-I6	none	none	OK	This is located adjacent to RA17.

September 21, 1993

Pat Parr

Buffer Zone for Upper Mitchell Branch

Thanks for your timely warning of the soon-to-occur removal of pines from upper Mitchell Branch. As you suggested, I (with the assistance of Wayne Schacher) marked an area along both sides of the stream to serve as a buffer zone to help minimize potential impacts to the upper reaches of the stream and particularly to a permanent reference site used primarily for the K-25 Biological Monitoring and Abatement Program.

The marked buffer zone consisted of a distance of ≈ 30 m along both sides of the stream; the contour of the land frequently made it necessary or possible to either increase or decrease this distance. Boundary markings were made with plastic, orange flagging. The marking was made from the stream's headwaters (located ≈ 50 upstream of my reference site) downstream to an area adjacent to the north portal area (attached figure); the southern side of the stream was actually marked down to a large hill adjacent to the eastern most portion of the main K-25 Plant site, while the northern side of the stream was marked to the edge of the woods adjacent to the trailers just east of the North entrance road. Where the markings began in the upstream area can clearly be seen from Blair Road with a single horizontal strip of flagging marking the beginning of both the north and south boundaries; no cuttings should be made along Blair Rd between the north and south entrances. Because I did not have a sufficient quantity of flagging to make a continuous marking along both sides of the stream, we chose to place horizontal strips of 5-15 ft at 20-40 ft intervals. We attempted to do this in a way that would allow someone to get a general idea of the overall line to be followed. Thus, a break between strips does not imply that I am saying that it is alright to move closer to the stream.

As we were marking the area, I noticed that several dead or dying pine trees were within the marked buffer area. I would not oppose having some of these trees cut, as long as they are left where they fall, and disturbance to surrounding hardwoods and underbrush can be minimized. I am opposed, however, to having any heavy equipment in the area or having any trees/logs drug out. In other words, I want to minimize disturbance of soils and vegetation within the buffer zones so that the amount of silt/sediment currently entering the stream will not be increased, and that sufficient vegetation remains to temper runoff into the stream.

September 21, 1993

Page 2

If you have any questions, please call.

A handwritten signature in cursive script, appearing to read "John", with a small mark above the "i".

John Smith, 1505, MS-6038 (6-4163)

cc: L. A. Kszos
J. M. Loar
M. G. Ryon
W. H. Schacher
E. M. Schilling

LTR.#PIA-TO/93-143

M. N MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

October 20, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 6 Area: Update

During the month of October 1993, additional sections of the Compartment 6 area were surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the sections that were surveyed. Results from the surveys of the Compartment 6 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. T. Cusick
L. B. Cobb
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

To: Dennis Bradburn
From: Pat Parr

Date: October 13, 1993
Subject: Expanded Compartment 6/ Pine Beetles

MARTIN MARIETTA ENERGY SYSTEMS, INC.

This memo addresses only the additional areas requested to be looked at in Compartment 6 as of October 6, 1993 (see attached map). The rest of the pine areas in Compartment 6 will still need to be surveyed. These areas in Compartment 6 have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 6 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 6 Summary:

There are no rare plants known to occur in the Compartment 6 areas marked to be cut.

C6-1 through C6-6 was evaluated previously and comments are in the memo of September 22, 1993.

C6-2 is now expanded and covers the whole marked area instead of the portion originally surveyed.

C6-5 and C6-3 are now joined together as one large area.

C6-17 is near George Jones Memorial Church. Should church members be communicated with regarding the activities?

There is a blue-line stream in this compartment- the upper section of Mitchell Branch. A 30-meter buffer has been flagged around Mitchell Branch by John Smith (see memo of September 22, 1993).

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Compartment 6 Expanded: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C6-2 expanded	none	none	OK	
C6-3 and C6-5 enlarged	none	none		Upper Mitchell Branch is here. Note attached map from John Smith, 6-4163. A buffer has been marked approximately 30 m from stream. Do not disturb inside buffer.
C6-7	none	none	OK	
C6-8	none	none	OK	
C6-9	none	none	OK	
C6-10	none	none	OK	
C6-11	none	none	OK	
C6-12	none	none	OK	
C6-13	none	none	OK	
C6-14	none	none	OK	
C6-15	none	none	OK	Hardwoods are coming into this area. Minimize disturbance.
C6-16	none	none	OK	Scattered white pine with no obvious infection. Try to leave them undisturbed.
C6-17	none	none	OK	This area is near George Jones Memorial Church. Members may want input.

Table continued

Compartment 6 Expanded: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C6-18	none	none	OK	
C6-19	none	none	OK	
C6-20	none	none	OK	
C6-21	none	none	OK	
C6-22	none	none	OK	
C6-23	none	none	OK	
C6-24	none	none	OK	

Distribution:

Helen Braunstein, 130MIT, MS-6282
✓Amy King, 101MID, MS-6481
Frank Kornegay, 4500N, MS-6198
Jim Loar, 1504, MS-6351
Jim Rogers, K-1001, MS-7155
Barbara Rosensteel, 1503, MS-6034
Mike Ryon, 1504, MS-6351
Beth Schilling, 1504, MS-6351
Bonnie Shoemaker, 0303-8, MS-7314
Dave Shriner, 1505, MS-6038
John Smith, 1505, MS-6038

-

Attachments: map and memo

LTR.#PIA-TO/93-168

N IN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

December 3, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Update on the Threatened and Endangered Plant Species Survey of the Compartment 7 Area

During the month of November 1993, sections of the Compartment 7 area were surveyed for potential impacts on rare plants due to the removal of pine trees from this area. Several rare plants were found in three of the sections that were surveyed. Results from the survey of the sections of the Compartment 7 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: November 24, 1993
Subject: Compt. 7, 2nd addition/ Pine Beetles

The additional areas in Compartment 7 that need to be cut due to the pine beetle infestation have been checked with respect to potential impacts on rare plants and wetlands. The original surveys for Compartment 7 (see memo of August 17, 1993) and the first additional surveys (see memo of August 28, 1993) covered areas C7-1 through C7-9. This report begins with C7-10.

Compartment 7 Summary:

Of the new areas we were requested to survey, there are only 3 that need to be left alone due to rare plant habitat, C7-20, C7-26, and C7-27.

Stream management zones will need to be left undisturbed for all stream areas. Some of these have been flagged. Stream buffers were flagged along certain sections of East Fork Poplar Creek and Bear Creek where the pine stands came close to the streams. In the other areas, there are adequate existing stands separating the pine stands from the stream. These will function as buffers for the stream if they are left undisturbed. No cutting or entry of logging vehicles or equipment should occur inside the flagged buffer areas or within the existing hardwood stand buffer areas. C7-16 should have silt fences or straw bales placed on the downslope side of any logging activity due to some steeper slopes and nearness to the East Fork Poplar Creek (see map).

If cutting is planned for the currently unflagged areas, please contact Barbara Rosensteel (6-2372) at least a week before the logging crews will be on the site to arrange the flagging of stream and/or wetland buffers.

Compartment 7 Additions: Pine Beetle Cutting, November 1993

Area	Rare Plants	Wetlands	Cut?	Notes
C7-10	no	no	OK	
C7-11	no	no	OK	- adjacent to stream boundary
C7-12	no	no	OK	
C7-13	no	yes	partial	- southeast corner is flagged
C7-14	no	no	OK	- adjacent to stream boundary
C7-15	no	no	OK	- adjacent to stream boundary
C7-16	no	no	OK	- adjacent to stream boundary
C7-17	no	no	OK	
C7-18	no	no	OK	
C7-19	no	no	OK	
C7-20	no	yes	Partial.	Contact Barbara Rosensteel (6-2372) at least a week ahead of preparing to cut the area so buffer can be flagged.
C7-21	no	yes	Partial.	Contact Barbara Rosensteel (6-2372) at least a week ahead of preparing to cut the area so the buffer can be flagged.
C7-22	no	no	OK	
C7-23	no	no	OK	
C7-24	no	no	OK	
C7-25	no	no	OK	- adjacent to stream boundary
C7-26	yes	no	Do not cut.	
C7-27	yes	no	Do not cut.	
C7-28	no	no	OK	
C7-29	yes	no	Do not cut.	

LTR.#PIA-TO/93-171

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

December 9, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 8 Area

During the month of December 1993, the Compartment 8 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the area that was surveyed. However, there are several locations within this area that may contain rare plants that are evident during other seasons. Results from the survey of the Compartment 8 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: December 1, 1993
subject: Compartment 8/ Pine Beetles

The areas within Compartment 8 that are needing to be cut due to the pine beetle infestation have been evaluated for potential impacts to rare plant habitats (plants are not visible in the winter), streams, and wetlands.

A table with comments on specific areas for Compartment 8 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 8 Summary:

There are numerous streams and tributaries throughout Compartment 8. Many of the stands can be partially cut, but the stream buffers will need to be flagged. Contact Barbara Rosensteel, 6-2372, at least 1 week in advance to cutting an area. Many of the stands have progressed from pine to hardwood stands and do not require any cutting. No rare plants were found (due to the season of the survey), however, there are potential habitats in the Compartment.

There are wet areas/rare plant habitat along the powerline right-of-way. Please do not cut under the powerline and do not allow disturbance (driving along it, laydown, equipment, etc.).

Compartment 8: Pine Beetle Cutting 1993

Area	Rare Plants	Wetlands Streams	CUT?	Notes
C8-1	possibly	yes	NO - Do not cut.	Boundaries are marked with yellow flagging.
C8-2	none	yes	Partial.	Some of the area may be cut. The stream buffer has NOT yet been flagged. Contact Barbara Rosensteel at least 1 week prior to cutting, 6-2372.
C8-3	none	yes	Partial.	Some of the area may be cut. The steam buffer has been flagged.
C8-4	possibly	yes	Partial.	The stream buffer has been marked with yellow flagging. This area is mostly hardwood and mature loblolly. Don't cut the hardwood.
C8-5	possibly	yes	NO.	This stand is now mostly mature hardwood.
C8-6	none	yes	Partial.	Some of the area may be cut. The stream buffer has NOT yet been flagged. Contact Barbara Rosensteel at least 1 week prior to cutting, 62372.
C8-7	none	yes	Partial.	The stream buffer has NOT yet been marked. Contact Barbara Rosensteel at least 1 week prior to cutting. 6-2372.
C8-8	none	yes	Partial.	The stream buffer has NOT yet been marked. Contact Barbara Rosensteel at least 1 week prior to cutting. 6-2372.

continued, Compartment 8: Pine Beetle Cutting 1993

Area	Rare Plants	Wetlands	CUT?	Notes
C8-17	none	yes		Partial. Stream buffers have NOT been marked. Contact Barbara Rosensteel at least 1 week prior to cutting. 6-2372.
C8-18	possibly	yes		NO. No longer much pine, mostly open with mixed hardwoods. Wetlands.
C8-19	possibly	none		NO. Very little shortleaf pine left. Mostly hardwood and white pine.
C8-20	none	none		OK.
C8-21	none	none		OK.
C8-22	none	none		OK.

LTR.#PIA-TO/93-163

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

November 22, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Update on the Threatened and Endangered Plant Species Survey of the Compartment 9 Area

During the month of November 1993, sections of the Compartment 9 area were surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the sections that were surveyed. However, there are several locations within these sections that may contain rare plants that are evident during other seasons. Results from the survey of sections of the Compartment 9 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

To: Dennis Bradburn
From: Pat Parr

Date: November 19, 1993
Subject: Comp 9 UPDATE/ Pine Beetles

MARTIN MARIETTA ENERGY SYSTEMS, INC.

The additional areas in Compartment 9 that need to be cut due to the pine beetle infestation have been checked with respect to potential impacts on rare plants and wetlands. Areas begin with C9-10 (See memo of August 23, 1993 for Compartment C9-1 through C9-9 data).

Compartment 9 Update Summary:

C9-23 had been cut prior to being surveyed.

Some large wetland areas (many also have known rare plant species) occur in Compartment 9. These should be avoided and are marked on the map as C9-26, C9-20, and C9-21. Smaller areas to avoid are also marked on the map. For any stream management zone questions, please contact Barbara Rosensteel (6-2372). There are some cabin ruins in south C9-21.

The large wetland area of C9-26 has been marked with orange and blue flagging. The buffer line basically follows the bottom of the slope. It is marked to protect wetlands and rare plants in the floodplain, and also Bear Creek.

In C9-20, there is one line of yellow flagging along the powerline right-of-way that was put up to mark buffer for the stream to the south. However, the area north of the ROW, as marked, should not be cut. There are two streams (potential Tennessee Dace habitat) and a wetland between the two streams. A buffer on the east side of C9-20 encompassing the wetland, the two streams and a subtributary of the southernmost stream has been marked with yellow flagging. The line starts at Walnut Orchard Rd. and winds through the pine stand and ends up on the powerline ROW.

The stream buffers for C9-21 are not flagged in the field since we understand that cutting may not occur here. **If cutting is needed, please contact Barbara Rosensteel (6-2372) so that the buffer can be flagged.**

Compartment 9: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C9-10	no	no	OK	
C9-11	no	no	OK	
C9-12	no	no	OK	
C9-13	possibly	no	NO - Do Not Cut	
C9-14	no	no	OK	
C9-15	no	no	OK	
C9-16	no	no	OK	
C9-17	possibly	no	NO - Do Not Cut	
C9-18	no	no	OK	
C9-19	no	no	OK	
C9-20	yes	yes	NO - Do Not Cut - see memo	
C9-21	possibly	yes	NO - Do Not Cut- see memo	
C9-22	no	no	OK - verbally approved earlier	
C9-23	no	no	OK - ALREADY CUT prior to survey	
C9-24	no	no	OK	
C9-25	possibly	no	NO - Do Not Cut.	
C9-26	yes	yes	NO - Do Not Cut - see memo	
C9-27	no	no	OK - verbally approved earlier	
C9-28	possibly	no	No - Do Not Cut	
C9-29	possibly	no	No - Do Not Cut	
C9-30	no	no	OK	
C9-31	no	no	OK	

LTR.#PIA-TO/93-172

TIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

December 9, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 10 Area

During the month of December 1993, the Compartment 10 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. Several rare plants were found in three sections of the area that was surveyed. Also, there are several locations within this area that may contain rare plants that are evident during other seasons. Results from the survey of the Compartment 10 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr

Date: December 3, 1993
subject: Compartment 10/ Pine Beetles

The areas within Compartment 10 that are needing to be cut due to the pine beetle infestation have been evaluated for potential impacts to rare plant habitats (plants are not visible in the winter), streams, and wetlands.

A table with comments on specific areas for Compartment 10 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 10 Summary:

There are numerous natural pine stands within Compartment 10. These are potential rare plant habitats and cannot be cut.

There are seven streams located within Compartment 10. Two of the streams (streams 1 and 2) flow to Bear Creek. Streams 3-7 flow to East Fork Poplar Creek. It is very important that these streams not be impacted in any way. Some of the streams that go through areas to be cut have been flagged. Others have not. Please contact Barbara Rosensteel (6-1272) at least 1 week prior to cutting an area if it needs to be flagged (these areas are noted in the attached table). If a stream or wet area is encountered in the field that has not been marked or identified on the map, please notify Barbara Rosensteel so she can check it out.

Compartment 10: Pine Beetle Cutting 1993

Area	Rare Plants	Wetlands	Cut?	Notes
C10-1	none	yes	Partial.	Most of this area is the Watson Road sludge area and the cutters may not enter it. There are small portions adjacent to the turnpike that can be cut. There are streams and tributaries in the area. Please contact Barbara Rosensteel (6-2372) at least 1 week prior to cutting so that the boundaries can be marked.
C10-2	none	none	OK	
C10-3	possibly	none	Partial.	No cutting in the natural pine stands. These are not marked in the field.
C10-4	possibly	yes	NO.	No cutting. Natural pine.
C10-5	possibly	none	NO.	No cutting. Natural pine.
C10-6	none	yes	Partial.	Stream management zone has not been flagged in the field because it appears to be within the fenced area. Some of the area is fenced due to contamination. Cutters may not enter roped off fenced areas.
C10-7	yes	yes	Partial.	Rare plant population is marked in eastern edge of pine plantation within a few yards of the hardwood forest and is marked with yellow and blue flagging. Do not cut the natural pine adjacent to the road. Do not cut southern portion that is adjacent to Hembree Marsh. It is flagged.
C10-8	none	yes	Partial.	Stream management zone runs through this area. It is flagged. Do not cut in that area.
C10-9	possibly	yes	NO.	Do not cut natural pine.
C10-10	no	no	OK.	
C10-11	yes	no	Partial.	Rare plant population is

marked near fence with blue and yellow flagging. Part of this area is now fenced. Cutters may not enter fenced area.

C10-12 possibly no NO. Do not cut. Natural pine.

C10-13 possibly no NO. Do not cut. Natural pine.

C10-14 possibly no NO. Do not cut. Natural pine.

C10-15 yes possibly NO. Do not cut. Natural Area 2.

C10-16 possibly no NO. Do not cut. Natural pine.

C10-17 possibly none NO. Do not cut. Natural pine.

C10-18 none possibly Partial. Stream management zone is not yet flagged in the field. Call Barbara Rosensteel at least 1 week in advance of cutting, 6-2372.

C10-19 possibly no NO. Do not cut. Natural pine.

LTR.#PIA-TO/93-137

M IN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

October 11, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 28 Area

During the month of October 1993, sections of the Compartment 28 area were surveyed for potential impacts on rare plants due to the removal of pine trees from this area. No rare plants were found in the sections that were surveyed, however, several rare plants have been identified in adjacent areas. Results from the surveys of the Compartment 28 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Dennis Bradburn
From: Pat Parr *per*

Date: October 4, 1993
Subject: Compartment 28/ Pine Beetles

This memo addresses only the areas originally requested to be looked at in Compartment 28 (see attached map). The rest of the pine areas in Compartment 28 will still need to be surveyed. The areas in Compartment 28 originally requested for surveying have been checked with respect to potential impacts on rare plants and wetlands.

A table with specific comments for Compartment 28 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 28 Summary:

There are no rare plants known to occur in the Compartment 28 areas marked to be cut. There are some sites near the areas to be cut that have been marked with flagging. Please make sure that there is no disturbance in those areas.

Aquatic Natural Area 4 (ANA4) is located adjacent to C28-I5. This stream contains the rare Tennessee Dace and a buffer area around the stream has been marked with flagging of various colors. Mike Ryon (4-7430) or Beth Schilling (4-4714) can provide more information. It is flagged along the upper end of Pinhook Branch of Midway Turnpike Rd.

In the far SW corner of Compartment 28, there is a shortleaf pine plantation just north of Bear Creek (near Bear Creek Road "ramp" to Hwy 95). There is a floodplain wetland adjacent to Bear Creek in this area that should not have heavy equipment in it. Stay out of the low elevation area south of the shortleaf pine area.

The stream off of Hagwood Rd. has a subtributary which enters from the north (C-28-14). There are pine areas on either side of the low area (wetland) surrounding a portion of this stream. This stream is not shown on the compartment map. No equipment should cross it. Please contact Barbara Rosensteel, 6-2372, when this area will be cut and she will flag the area.

Bear Creek North Tributary 15 flows north-to-south somewhere west of Gun Branch Road. It is deep, and steep- sided in the section of the right-of-way. It is marked on the map as best as it can be estimated.

Presence of streams or lakes in or adjacent to the area to be cut have been indicated in the "notes" section. This will alert you that they are there and should be located in the field to ensure a vegetated buffer and/or appropriate erosion control measures are taken. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Distribution:

Helen Braunstein, 130MIT, MS-6282

✓ Amy King, 101MID, MS-6481

Frank Kornegay, 4500N, MS-6198

Jim Loar, 1504, MS-6351

Jim Rogers, K-1001, MS-7155

Barbara Rosensteel, 1503, MS-6034

Mike Ryon, 1504, MS-6351

Beth Schilling, 1504, MS-6351

Dave Shriner, 1505, MS-6038

Peter Souza, 130MIT, MS0020

Compartment 28: Pine Beetle Cutting 1993

Area	Rare plants	Wetlands	Cut?	Notes
C-28-I1	none	none	OK	There are rare plants nearby. The area has been flagged. Do not cut or allow equipment within the flagged area.
C-28-I2	none	none	OK	There is a wetland along the south side as shown on map. Nearby sites of rare plants are shown on the map. Please do not allow those areas to be impacted in any way.
C-28-I3	none	none	OK	
C-28-I4	none	yes	OK	There is a narrow wetlands along a subtributary of East Tributary 1 located between pine plantings. Avoid the stream and wetlands. Bear Creek East Tributary 1 is on the south side.
C-28-I5	none	none	OK	Aquatic Natural Area 4 which contains the rare TN Dace is around this area to be cut. The buffer has been marked with flagging.

LTR.#PIA-TO/94-003

MARTIN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

January 14, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Compartment 28 Area: Update

During the month of January 1994, the Compartment 28 area was surveyed for potential impacts on rare plants due to the removal of pine trees from this area. Several rare plants are known to exist in two sections of the area that was surveyed. Also, there are several locations within this area that may contain rare plants that are evident during other seasons. Results from the survey of the Compartment 28 area are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 241-4222, if you have any questions.

Sincerely,

Sharon R. Conder, Acting Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier
A. D. King
P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

To: Dennis Bradburn
From: Barbara Rosensteel

Date: January 5, 1993
Subject: Compartment 28/Pine Beetles

The areas in Compartment 28 that are mapped as pine plantations or natural pine (mixed pine/hardwood) have been surveyed in the field with respect to possible impacts on potential rare plant habitats (since the actual plants are not visible during the winter) and given a preliminary review in the office to determine where Stream Management Zones (SMZ) and wetland buffers may need to be established. Please contact me at least a week before you intend to log the stands for which SMZs are indicated so that we can mark them in the field.

A table with specific comments for Compartment 28 is attached. The area designation on the table corresponds to those marked on the maps.

Compartment 28 Summary:

It was not possible to identify any rare plants due to the time of year. However, some areas of known rare plant occurrence and areas of potential rare plant habitat have been identified.

In some former pine plantations in which hardwoods now comprise a large percentage of the canopy it was determined that logging was not necessary because large areas of hardwoods and areas approved for cutting surround them and will be an effective buffer against SPB spread. In addition, these areas do not fit within the cutting guidelines. In cases where they do fit within the guidelines, pine cutting is approved, but hardwoods in the stand should not be cut or damaged.

In some cases, other concerns may limit logging access and other people must be contacted (i.e.; WAGs, sludge application areas, surface danger zones, etc.)

There are wetlands and three Aquatic Natural Areas in Compartment 28. SMZs will need to be established around all the streams and wetlands prior to logging. Stands in which SMZs are needed have been indicated in the "notes" section. ESD will work with FMG staff to establish the SMZs. We understand that you will be working with the appropriate representative on BMPs, permits (where needed), etc.

Distribution:

Helen Braunstein, 130MIT, MS-6282
Amy King, 101MID, MS-6481
Frank Kornegay, 4500N, MS-6198
Jim Loar, 1504, MS-6351
Pat Parr, 1506, MS-6034
Jim Rogers, K-1001, MS-7155
Mike Ryon, 1504, MS-6351
Beth Schilling, 1504, MS-6351
Bonnie Shoemaker, 0303-8, MS-7314
Dave Shriner, 1505, MS-6038
Bill Thompson, K0303-7, MS-7328

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-1	yes	yes	<u>Yes</u>	Rare plant areas have been marked on map and flagged in field; SMZ needed at southeast end only.
C28-2	none	yes	<u>Yes</u>	Buffer will be needed around wetland (see map).
C28-3	none	yes	<u>Yes</u>	Small stream goes through eastern end of stand. This will need SMZ.
C28-4	none	yes	<u>Yes</u>	This plantation is near a Bear Creek tributary and also has a subtributary going through it. SMZs are needed.
C28-5	none	yes	<u>Yes</u>	Aquatic Natural Area 4 which contains the rare TN dace is in the area. <u>The SMZ has already been flagged.</u>
C28-6	none	no	<u>Yes</u>	However, this stand is within the WAG 11 fence which may prevent logging in the area. Contact appropriate person.
C28-7	none	yes	<u>Yes</u>	As with -6, this stand is at least partially within WAG 11 fence. If logging is permitted, an SMZ will be needed for the Bear Creek tributary.
C28-8	none	yes	<u>Yes</u>	SMZ will be needed for Bear Creek trib. How will stand be accessed?
C28-9	none	yes	<u>Yes</u>	SMZ will be needed for Bear Creek trib. How will this stand be reached?
C28-10	none	yes	<u>Yes</u>	This stand is within WAG 11 fence. If logging allowed, will need SMZ.
C28-11	none	yes	<u>Yes</u>	This stand is within WAG 11 fence. If logging allowed, will need SMZ.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-12	none	yes	<u>Yes</u>	Part of this stand is inside WAG 11 fence. If logging allowed, SMZ will be needed.
C28-13 and -14				These stands are mapped as a 1948 shortleaf pine plantation, 1948. No stands fitting this description were found. The stands have succeeded to a hardwood forest; In addition, these areas are surrounded by hardwood stands and a few areas that are approved for logging; Therefore, an effective buffer will be present.
C28-15	none	no	<u>Yes</u>	There are many hardwoods in the canopy in this stand. There is SPB damage and these trees may be dead and no longer infested. No hardwoods should be cut. If the pines are dead or no longer infested, they also should not be cut.
C28-16	none	yes	<u>Yes</u>	SMZ will be needed.
C28-17	none	no	<u>Yes</u>	There are hardwoods in the canopy in this stand. Succession to hardwoods occurring. There is SPB damage and these trees may already be dead and no longer infested. No hardwoods should be cut. If the pines are dead or no longer infested, they also should not be cut.
C28-18	none	no	<u>Yes</u>	This stand is about 50:50 hardwood and pine. In some areas, hardwoods dominate. If it is necessary to log in this stand, no hardwoods should be cut or damaged.
C28-19	none	yes	<u>Yes</u>	Southern half is okay to log but will need SMZ along Pinhook Branch which is a BMAP site. Northern section has a co-dominance of pines and hardwoods. The pines appear to be already dead and no longer infested. Uninfested, dead pines and hardwoods should not be cut.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-20	possible		<u>No</u>	Natural pine stand that is dominated by hardwoods in the canopy and subcanopy. There are dead, uninfested pines in the eastern side of the stand.
C28-21	possible		<u>No</u>	A 1948 plantation that has succeeded to hardwoods (oaks, hickory, maple, sweetgum). There is some SPB damage in this stand that may be dead, noninfested trees. The area does not fall within the cutting guidelines. There is an effective buffer of hardwood stands and stands to be logged.
C28-22	none	yes	<u>Yes</u>	One area mainly SL pine and white pine; most of area old cutover area dominated by white pine, sycamore, elm and red maple. The dominant tree species suggest wetland in this area. SMZ will be needed at Pinhook Branch and another trib., and at possible wetland.
C28-23	none	yes	<u>Yes</u>	Pinhook Branch will need SMZ.
C28-24	none	yes	<u>Yes</u>	This stand is reverting to hardwoods. No hardwoods should be cut or unnecessarily damaged. SMZ will be needed along Pinhook Branch.
C28-25	none	yes	<u>Yes</u>	ANA 5 is located in this stand. SMZs will be needed. Hardwoods dominate along the streams. Plantation exists only from 50-350 feet from Gum Branch Road. The majority of the area is mixed pine/hardwood. Only pines should be logged from the pine/hardwood area. No hardwoods should be cut or damaged.
C28-26	none	yes	<u>Yes</u>	SMZ will be needed for stream in southern portion of this stand. It is a tributary to the ANA 5 stream. Efforts should be made to preserve as many of the understory hardwoods as possible so that natural regeneration of hardwoods may continue after pine logging.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-27	none	yes	<u>Yes</u>	This stand is 50:50 pine and hardwoods. Succession to a hardwood forest is occurring. Some of the pines are dying. It is possible that this stand is no longer infested. If logging is to occur in this large area to control the spread of the SPB, it should occur only around the eastern, western, and southern periphery of the stand in order to protect (although the surrounding stands 5, 18, 19, 22, 23, and 26 have already been infested and are approved for logging). The interior of the stand should not be logged and no hardwoods should be cut or damaged. An SMZ will be needed along the ANA 5 stream.
C28-28	none	no	<u>Yes</u>	Logging can occur in the loblolly plantation and selective removal of pines in the old shortleaf pine plantation. Hardwoods should not be cut.
C28-29	none		<u>No</u>	1948 shortleaf pine plantation that has succeeded to a mixed hardwood/pine stand with hardwoods co-dominant species. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-30	yes		<u>No</u>	There are rare plants in this stand and a Natural Area. It is a 1948 shortleaf pine plantation that has succeeded to a mixed hardwood/pine stand with hardwoods co-dominant species. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-31	none	no	<u>Yes</u>	Since this area falls within guidelines (visibility from road) it is approved for cutting. However, hardwoods are co-dominants in this stand and should not be logged.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-32, -33, -34, -35			<u>No</u>	1948 shortleaf pine plantations that have succeeded to a mixed hardwood/pine stand with hardwoods co-dominant species. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-36, -37, -38			<u>No</u>	1948 shortleaf pine plantations that have succeeded to a mixed hardwood/pine stand with hardwoods co-dominant species. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-39	none	no	<u>Yes</u>	
C28-40	none	no	<u>Yes</u>	
C28-41	none		<u>No</u>	Cut over area reverted to natural pine/hardwood. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-42	none	no	<u>Yes</u>	
C28-43	none	no	<u>Yes</u>	
C28-44	none		<u>No</u>	Old plantation, now mostly hardwoods. Logging of stands surrounding this (39, 40, 45, 46, 47) will form effective buffer, if one is needed.
C28-45	none	no	<u>Yes</u>	Currier Cemetery is within this stand.
C28-46	none	no	<u>Yes</u>	Old sludge application area. Check if anything recent has been done.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-47	none	no	<u>Yes</u>	
C28-48	none	yes	<u>Yes</u>	ANA 2 (Bear Creek and perennial spring) will need SMZ. There are hardwoods in canopy which should not be cut or damaged.
C28-49	none	yes	<u>Maybe</u>	There will be an SMZ established at Bear Creek. It is possible that because of location of the BMAP station at weir here that no little logging, if any, will be allowed in this stand or Stand 48.
C28-50	none	yes	<u>Yes</u>	Northern half of stand is plantation and can be cut. Southern half of plantation is hardwood-dominated and is close to Bear Creek. This will probably be flagged within the SMZ.
C28-51	none	yes	<u>Yes</u>	An SMZ needs to be established at Bear Creek. Although pines are dominant, there are hardwoods in the canopy. These should not be cut.
C28-52	none	yes	<u>Yes</u>	Southern half needs SMZ at Bear Creek
C28-53	none	no	<u>Yes</u>	Stand 52 SMZ will be south of this stand.
C28-54	none	maybe	<u>Yes</u>	Will have to check when marking other SMZs whether one is needed here.
C28-55	possible		<u>No</u>	Bear Creek NT15 flows through center of mixed pine/hardwood stand. SMZ established for Stand 54 may take up most of this area. What this SMZ does not preclude from cutting in the Stand 55 area may be cut. However, no hardwoods should be cut.
C28-56	none	yes	<u>Yes</u>	Will need SMZ along Bear Creek.

Compartment 28: Pine Beetle Cutting 1994

Area	Rare Plants	Is SMZ needed?	OK to log?	Notes
C28-57	none	no	<u>No</u>	1948 shortleaf pine plantation and cutover area that have succeeded to a mixed hardwood/pine stand with hardwoods co-dominant species. Areas around this stand include hardwood stands and other stands approved for logging which will provide adequate buffers against potential spread from this area. This area does not fall within the cutting guidelines.
C28-58	none	yes	<u>Yes</u>	Will need SMZ in southern portion along Bear Creek.
C28-59	none	maybe	<u>Yes</u>	May need SMZ at subtrib.; will have to check while doing other SMZs in area.
C28-60	none		<u>No</u>	This is a small area along a stream. It is mapped as natural pine, oak, and poplar. Canopy now dominated by oaks. Remains of an old homesite are here. It does not fall within the cutting guidelines and the area around it is approved for selective cutting of pines.

M/ N MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831
September 1, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and endangered plant species survey of the Freels Bend Operable Unit

On August 8, 1993, Larry Pounds and Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the Freels Bend Operable Unit (OU). No listed plant species were found at that OU. A general description of the field survey, with results, is enclosed for your information. Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK

Enclosure

cc/enc: D. T. Bell
P. D. Parr
S. P. Riddle, DOE-ORO

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr

Date: August 27, 1993
Subject: Freels Bend OU

Plant survey area: **Freels Bend OU**

Botanist: Rebecca Cook and Larry Pounds, The University of Tennessee.

Field survey dates: 1993: June 29, July 29, August 8.

Status: All four OUs have been surveyed.

Results: No rare plants were found in the OU.

Note: Locations of species and areas discussed are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: P. D. Parr, ESD.

General description:

Cutting to control pine beetle infestations is planned for part of the section marked Site 4 on the map of the Freels Bend OU. Cutting is planned, also, for an area near Site 2.

The Research Park Natural Area 22 lies to the north of the Freels Bend OU.

Freels Bend OU consists of 4 sites:

Site 1: This site is located nearest the entrance to Freels Bend. A number of buildings are located here. The more southern boundary runs parallel to an old road. Most of this section is open field. Common grasses including Festuca elatior (meadow fescue), Bromus sp. (Brome grass) and, Dactylis glomerata (Orchard grass) are present. Much of the area is grown over with Lonicera japonica (Japanese honeysuckle) and Rubus sp. (blackberry). The northern portion of the OU is in a forested area. Common overstory trees include Quercus alba (White oak), Acer rubrum (Red maple), Liriodendron tulipifera (Tulip poplar), Liquidambar styraciflua (Sweetgum), and Fagus grandifolia (Beech). Except in areas with much honeysuckle and Microstegium vimineum, the ground cover was sparse. Other species included Parthenocissus quinquefolia (Virginia creeper), Podophyllum peltatum (Mayapple), Asarum canadense (Wild Ginger).

Site 2: This site is located to the south and west end of the first site at the top of a knob. The OU appears to be in an area that was previously open, but has been allowed, in some areas, to grow back. The sections that have grown back are thickets of Virginia pine (Pinus virginiana) and Japanese honeysuckle. The remainder of the OU had been recently mowed.

Freels Bend OU, continued.

August 27, 1993

The site itself is unsuitable for rare plants. The forested area around the OU, particularly to the west and north could support such species as Ginseng (Panax quinquefolium) or Lesser ladies tresses (Spiranthes ovalis) although none were seen. This forested area is the oak with pine forest common in the region.

Freels Bend Ou.

Site 3: This site is located south of the second site. This OU is in a depression that appears to be a sinkhole. It is predominantly open with scattered trees such as sycamore (Plantanus occidentalis), red elm (Ulmus rubra), Hackberry (Celtis sp.), and black walnut (Juglans nigra). Ground cover includes Fescue, wingstem (Verbesina sp), and wild onion (Allium sp).

Site 4: This site has been cleared at some point and has regrown into a pine forest. The very tip end of the point has the youngest trees and is the most open. Virginia pine (Pinus virginiana) is the dominant with red cedar (Juniperus virginiana) also common. The understory is predominantly dogwood (Cornus florida). A number of hardwoods are present in the sapling layer, including sweetgum, hickory (Carya sp), sugar maple (Acer saccharum), various oaks (Quercus sp.), and privet (Ligustrum sp.). The ground cover includes Japanese honeysuckle, poison ivy (Toxicodendron radicans), Virginia creeper, and Lespedeza sp. Going northward, the forest is still pine, but the trees are older and there are more hardwoods. This area includes both Virginia pine and shortleaf pine (Pinus echinata). Hardwoods and ground cover are those listed above. There is evidence of past erosion (gullies with mosses and reindeer lichens). The site is currently unsuitable for the rare plant species known on the Oak Ridge Reservation. However, the area to the north of the OU is a relatively undisturbed hardwood forest with White oaks (Quercus alba), other oaks, hickories, beech, buckeye (Aesculus flava), and sugar maple. The understory appears to be relatively rich and contains Jack-in-the-Pulpit (Arisaema triphyllum), bellwort (Uvularia perfoliata), wild ginger (Asarum canadense) and other such species. It is habitat suitable for ginseng.

Note: this area was surveyed recently (probably last year). Survey lines were cleared. One line runs to the road at the NE corner of the baseball field at the Clark Center.

map attachment

cc: Barbara Rosensteel

LTR.#PIA-TO/93-120

M. IN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 21, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and endangered plant species survey of the K-25 Ground Water Operable Unit

On September 9, 1993, Mr. Larry Pounds and Ms. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the K-25 Ground Water (GW) Operable Unit (OU). The southern portion of the K-25 GW OU was surveyed in 1992 as part of a K-25 project and was not revisited this year. The remaining portions of the K-25 GW OU were surveyed during the months of July, August, and September 1993. Two rare plants were found in the K-25 GW OU. Results from the surveys of the K-25 GW OU are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
K. W. Cook
M. F. P. DeLozier

P. D. Parr
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr *pparr*

Date: September 15, 1993
Subject: K-25 GW OU

Plant survey area: **K-25 GW OU**

Botanists: Larry Pounds and Rebecca Cook, The University of Tennessee.

Field survey dates: 1993: July 8, 13, 19, 20, 23, 26; August 3, 11, 16, 28; September 9.

Status: Preliminary survey of area is complete. A couple of sites will need to be re-visited during other growing seasons.

Results: Two rare plants were found in the K-25 GW OU. They are in Area 10 OU and south of Area 10 OU.

Note: Locations of species and areas discussed are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: P. D. Parr, ESD.

General description: The K-25 GW OU consists of the area around the K-25 plant facility. There are a number of small OU's included.

Peninsula including K-770 OU: The embayment of Poplar Creek together with Watts Bar Lake create two peninsulas in the western part of the K-25 GW OU. The westernmost peninsula contains the power plant area (K-770 OU) which has been highly disturbed. The eastern side of the peninsula is wooded.

Peninsula south of Area 10 OU: The second peninsula is directly east of the one containing K-770 OU and south of Area 10 OU. Duct Island Road goes out into this peninsula. Most of the peninsula is disturbed or planted in pine. In the southwest portion (marked on map) is a forest with many large beech trees. This area may be recommended for designation as a Research Park Reference Area due to the occurrence of this habitat which is unusual for the Oak Ridge Reservation. Along the northwest side of the peninsula is an area of rocky ledges along the lake (marked on map). This area will be designated a Research Park Natural Area since it contains two state-listed species, one of which is a federal candidate, which were discovered during this survey. Most of this potential natural area lies in Area 10 OU and more detail is given in the Area 10 OU section.

K-25 GW OU continued, page 2

Northern portion of K-25 GW OU (north of Poplar Creek, excluding Area 10 and K-33): This area is generally wooded, partly in pine plantations, with openings where utility lines are located. Research Park Reference Area 23 (RA 23), Great Blue Heron Rookery, is found here.

Area 10 OU: This is located in the portion of K-25 north of Poplar Creek. Most of the habitat of the two rare plants found occurs in this area. The two state-listed species that occur here are Draba ramossima and Aureolaria patula (candidate for federal listing). Cornus drumondii, a species rare in east Tennessee is found here also. More rare species may be found in this area where there are many ledges when it is studied through a whole growing season. In general the Area 10 OU is highly impacted by powerlines.

K-33 OU: This includes the developed areas of K-25 north of Poplar Creek. On the south side of K-33 on Poplar Creek is a small, wooded area which is used by Great Blue Herons as a rookery. This second rookery has been designated as Research Park Reference Area 30 (marked on map as RA 30). No rare plants were found to occur here.

Southern portion of K-25 OU: South of Poplar Creek, most of the K-25 GW OU is developed. The only area with natural vegetation inside the fence is K-1070. K-1070 is partly wooded. It was surveyed for rare plants and wetlands as part of the K-25 K-2070-C/D Classified Burial Ground project in November 1992. No rare plants were found. A copy of the report is attached. Outside the fence on the southeast side is an Aquatic Reference Area (ARA 1). An area of wetlands also occurs there along another watershed (marked on map). The wetlands in this area take an unusual form. Normally on the reservation wetlands develop in riparian areas adjacent to streams. In this case, the wetland development is often right in the stream drainage between steep slopes. Small green wood orchid (Platanthera clavellata) is found here. It is an indicator of a relatively low disturbance level wetland. Much of this area is in oak forest with pine plantation near Highway 58. Research Park Reference Area 17 (RA17) is partially in the K-25 OU on the east.

K-25 GW OU continued, page 3

K-1007: The wet mowed area bordering the K-1007 pond have two unusual sedges. Eleocharis parvula is most common in saltmarshes and it's occurrence here is a first for the state of Tennessee (Atlas of Tennessee Vascular Plants-Volume 1, 1993 by Chester, Wofford, Kral, DeSelm, Evans). Cyperus acuminatus is also a first for east Tennessee. These two sedges are probably recent arrivals in the area brought in by waterfowl. This area may be considered for Research Park Reference Area designation due to the occurrence of these species.

Rare plants found:

Draba ramossima Branching Witlow-grass Tennessee listed as a species of special concern. It is found along the river edges of K-25 GW OU. It is in the cross-hatched area on the map.

Aureolaria patula Spreading False-Foxglove Tennessee listed as Threatened. It is a federal candidate (C1) for listing. It is found in Area 10 OU and the peninsula south of Area 10 OU. It is marked with cross-hatching on the map.

map attachment
report attachment
cc: Barbara Rosensteel

The map indicating the locations of rare plants is considered sensitive information and has been withheld from this distribution. If a need-to-know situation arises and the exact locations of the surveyed rare plants is necessary, contact Amy King (6-1509) or Pat Parr (6-8123) to obtain a locations map.

Internal Correspondence

November 20, 1992

Joni Oliver, Bldg K-303-8, MS-7314

Wetland and Rare Plant Survey of the K-25 K-1070-C/D Classified Burial Ground

I. INTRODUCTION

The wetland and rare plant survey of the above referenced site was conducted on November 18, 1992 by Barbara Rosensteel and Larry Pounds. The field method for wetland identification was based on the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987). During a rare plant survey the site is searched for species that are listed or proposed for listing as endangered, threatened, or of special concern by the the Tennessee Department of Environment and Conservation (TDEC) or the U.S. Fish and Wildlife Service (USFWS), and for potential habitat for these species.

II. SURVEY FINDINGS

No wetlands, streams, or rare plants were found on the site. The Classified Burial Ground site is a highly disturbed area. Most of the site consists of an open field located on the top and sides of a knoll. The field supports an early successional old field community of low vegetational diversity. The dominant species are goldenrods (Solidago sp.) and asters (Aster sp.).

On the northwest side of the site, there are steep slopes incised by narrow, steep draws. The dry slopes support an oak-hickory community. Other canopy and subcanopy species include black cherry (Prunus serotina; FACU), maple leaf viburnum (Viburnum acerifolium; FACU), and white pine (Pinus alba; not listed) on the slopes and red maple (Acer rubrum; FAC) and sweetgum (Liquidambar styraciflua; FAC) in the draws. Groundcover species include Christmas fern (Polystichum agrostichoides; FAC), little brown jug (Asarum arifolium; FAC) and broad beech fern (Thelypteris hexagonoptera; FACU+). Old field communities dominated by grasses, blackberry, and sumac are at the fence near the slope bottoms.

The draws contain wet-weather conveyances that carry storm runoff from part of the site. There are no wetlands and no apparent streams in the draws. The presence of streams is sometimes difficult to detect at this time of year. The TDEC defines a stream as having a groundwater connection and supporting aquatic life during some part of the year. The conveyance channels in these draws did not appear to meet either of these criteria.

oml

the bottom of the draw in the northwest corner of the site, there is a small spring located at the fenceline. A small volume of water was flowing from the spring and through a culvert under the fence. There are no onsite streams or wetlands associated with this spring. Its location is being noted for information purposes only.

In the southwest corner of the site outside of the fence there is a perennial spring. The spring is located at the bottom of a maintained grassy bank. The spring water issues from a pipe located in a grassed, roadside drainage swale. The water is highly contaminated. There are no jurisdictional wetlands at this spring.

Since it is the non-growing season, we did not expect to find rare plant species growing on the site during this survey and so we searched primarily for any plant remains or potential rare plant habitat. Usually a full growing season survey is recommended. However, after considering the highly disturbed condition of the site and the type of habitat that remains on the northwestern end of the site, it was determined that additional surveys conducted in the growing season are unlikely to find any of the rare plant species known to occur on or in the general vicinity of the Oak Ridge Reservation. Therefore, a growing season survey of this site will not be necessary.

Barbara A. Rosensteel

Barbara A. Rosensteel, Associate Biologist
Rare Plant and Wetland Surveys
Bldg. 1506, MS-6034 (6-2372)

cc: Patty Goddard, K-1310-K, MS-7256

LTR.#PIA-TO/93-146

M. IN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

October 22, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and Endangered Plant Species Survey of the Melton Valley Ground Water Operable Unit

On August 31, 1993, Mr. Larry Pounds and Ms. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the entire Melton Valley (MV) Ground Water (GW) Operable Unit (OU). Seven rare plant species, two of which are federal candidates, have been found in the MV GW OU. Results from the survey are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
H. L. Boston
L. B. Cobb
L. T. Cusick
M. F. P. DeLozier

N. Hendrix-Ward

Page 2 of 2

October 22, 1993

P. D. Parr

S. P. Riddle, DOE-ORO

File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr
cc: ✓Sharon Conder, Barbara Rosensteel

Date: October 18, 1993
Subject: Melton Valley GW OU

Plant survey area: **Melton Valley GW OU**

Botanist/surveyor: Larry R. Pounds and Rebecca Cook, The University of Tennessee

Field survey dates: 1993 April 22; May 9, 21, 31; June 1, 4, 6, 11, 12, 15, 21, 23, 24, 26, 28; July 16, 29; August 7, 10, 14, 31.

Status: entire area has been surveyed.

Results: Seven rare plant species have been found in the Melton Valley GW OU. Two are federal candidates.

Note: Locations are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know only basis.

Report prepared by: P. D. Parr, ESD.

General description: The Melton Valley GW OU extends from the Clinch River (Watts Bar Lake) on the east to the Clinch River (Melton Hill Lake near Bearden Creek embayment or the Roane County/Anderson County line).

1) **The south slope of Haw Ridge (north of Lagoon Rd. and Melton Valley Rd)** is broken by two water gaps. One for White Oak Creek and one for Bearden Creek. Bearden Creek Gap is rather undisturbed. This area will be designated a Research Park Natural Area because of the rare plant species, Canada Lily or Michigan Lily (State status of "Threatened"), found here. The east end of the south slope is Research Park Natural Area 6 (NA6) and provides protection for the spreading false-foxglove (State status "Threatened", Federal status "C1"). In general the south slope of Haw Ridge is heavily wooded with oak often dominant.

2) **South of Haw Ridge, the low hills** located south of Lagoon Road and Melton Valley Drive are frequently dissected by streams and do not form a coherent ridge. This area is forested in general, but is more disturbed than Haw Ridge. Pink lady's slipper (State status "Threatened") and ginseng (State status "Threatened") are found in upland areas. Canada or Michigan Lily has been found in one low area. On the east is a small area, Research Park Reference Area 10 (RA10) where there is a successional community with Virginia pine and reindeer lichen. Research Park Aquatic Reference Area 9 (ARA9) lies partly in this area.

3) **White-Oak Melton Branch Valley** is the floodplain of White Oak Creek and its continuation along Melton Branch. Much of this area is contaminated. Wetlands are common. there is an extensive marsh just east of White Oak Lake. In a wetland on the north margin of White Oak Lake some plants which are possible Scirpus fluriatilis have been found. this is a very rare species in the southeastern United States, though frequent in the midwest. Positive identification requires fruits which we have not been seen. On the bank of White Oak Creek near the Clinch River is a tree that may be a butternut, *Juglans cinerea*. The butternut is listed by the State as "Threatened", and is on the Federal list as status "C2".

4) **The bottom of the north slope of Copper Ridge** is a gentle slope. There has been much past disturbance here as indicated by the presence of Virginia pines and red cedars.

Rare Plants found in Melton Valley GW OU

Spreading false-foxglove, Aureolaria patula. The false-foxglove is found on a section of steep slope along the Clinch River on Haw Ridge. Its status is "Threatened" on the State list, and "C1" on the Federal list (it is a candidate for federal listing). It is marked as "Ap" on the map.

Pink lady's slipper, Cypripedium acaule. The lady's slipper is scattered in the dry acid soil forests throughout the Oak Ridge Reservation. Only two known sites are in Melton Valley GW OU ("Ca" on the map). More sites are probably present.

Nuttall waterweed, Elodea nuttallii. This is found in one embayment in the Melton Valley GW OU. The plants may not be reproducing in this population. Location is marked as "En" on the map. It is listed by the state as a species of "special concern".

Butternut, Juglans cinerea. Butternut is listed by the state as "Threatened" and is on the federal list as "C2". There is one small tree in the Melton Valley GW OU that appears to be dying. Identification is tentative because of the difficulty in separating young black walnuts and butternuts. It is identified on the map as "Jc".

Lily, Lillium canadense or michiganense. There are three lily sites in wet areas. The plants have not been seen in flower. They may be either Canada lily or the closely related Michigan lily. Either one is state listed as "Threatened". They are marked on the map as "L".

Ginseng, Panax quinquefolius. There are probably many sites for ginseng in the OU. It is scattered in wooded areas of the Reservation. Eleven sites are marked on the map, identified as "Pq". It is state listed as "Endangered" due to digging.

Lesser ladies tresses, Spiranthes ovalis. These orchids are scattered in the forested areas in which they occur- and are very inconspicuous. Two sites are marked on the map as "So".

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 9, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 7

On July 29, 1994 Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 7 (NA7): Walker Branch Embayment Barren. Two new populations of tall larkspur (*Delphinium Exaltatum*) were identified. Tall larkspur is classified as endangered by the State of Tennessee and is a Federal C2 candidate. The enclosed letter report discusses survey findings in detail.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc: T. L. Ashwood D. J. Awl L. B. Cobb K. W. Cook
L. T. Cusick M. F. P. DeLozier C. A. Gabrielsen E. L. Hannahs
A. C. Holder R. K. Holmes P. D. Parr P. Phillips, DOE-ORO
S. P. Riddle, DOE-ORO File-ER Document Management Center-RC

To: Amy King
From: D.J. Awl

Date: August 18, 1994

Plant Survey Area: Research Park Natural Area 7: WALKER BRANCH
EMBAYMENT BARREN

Botanists: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: July 29, August 3, 1994

Status: All of the area was surveyed.

Results: Two new populations of tall larkspur (*Delphinium exaltatum*) were located. Tall larkspur is classified as endangered by the State of Tennessee and is a federal C2 candidate.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

Natural area 7 is located south of Bethel Valley Road. It runs from road to CFRF eastward to the Walker Branch Embayment of Melton Hill Reservoir. It extends approximately two thirds of the way up Haw Ridge. The area has numerous limestone outcrop areas. Much of the area is forested but it is transected by a gasline and powerline. Tall larkspur (*Delphinium exaltatum*) is found primarily in the mown right-of-ways of both the gasline and powerline but is also found in scattered locations throughout the forested sections.

Tall larkspur is listed as endangered by Tennessee. It is also a federal C2 candidate. C2 candidate species are those species for which available information indicates they are threatened or endangered but for which substantial biological data is lacking. It is known to occur in 4 other locations on the reservation. The location of another large population with this survey suggests that the species may be spreading on the reservation, primarily in grassy areas such as powerline right-of-ways.

A large population was found in the powerline right-of-way just east of Melton Valley Access Road. The populations extends about two thirds of the way down the slope towards Bethel Valley Road. Approximately 550 flowering individuals were counted. Vegetation in the right-of-way is primarily herbaceous with some young trees. Common species include lespedeza (*Lespedeza sp.*), nodding onion (*Allium cernuum*), thimbleweed (*Anemone virginiana*), indian grass (*Sorghastrum nutans*), ox-eye (*Heliopsis helianthoides*), blackberry (*Rubus sp.*), tulip poplar (*Liriodendron tulipifera*) and Virginia pine (*Pinus virginiana*). There are scattered individuals of tall larkspur in the forested areas on either side of the right-of-way also.

A second population was located and flagged. This population was located in the wooded area just above a small

stream at the base of Haw Ridge. Twenty-six individuals were counted. The site was dominated by red cedar (*Juniperus virginiana*) and white pine (*Pinus strobus*) with yellow oak (*Quercus muehlenbergii*), white oak (*Q. alba*), northern red oak (*Q. rubra*) and Virginia pine also common. Ground cover species included Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), mayapple (*Podophyllum peltatum*), *Brachyletrum erectum* and starry campion (*Silene stellata*). Except for the presence of white pine, this site was very typical of vegetation throughout the natural area.

A small population of tall larkspur was previously reported in the gasline right-of-way near the east end of the natural area. This population was not relocated. Much of the right-of-way in that area has a very tall, dense growth of lespedeza which may have obscured the plants.

Three powerline right-of-ways outside of NA7 at its western end were also checked for tall larkspur. None was found at this time. If tall larkspur is found in these areas in the future it will give us some information about dispersion rates.

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 9, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 8

During August 1994 Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 8 (NA8): McCoy Branch Embayment Barren. The known population of tall larkspur (*Delphinium Exaltatum*) was re-identified. Tall larkspur is classified as endangered by the State of Tennessee and is a Federal C2 candidate. The enclosed letter report discusses the survey findings in detail.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc:	T. L. Ashwood	D. J. Awl	L. B. Cobb	K. W. Cook
	L. T. Cusick	M. F. P. DeLozier	C. A. Gabrielsen	E. L. Hannahs
	A. C. Holder	R. K. Holmes	P. D. Parr	P. Phillips, DOE-ORO
	S. P. Riddle, DOE-ORO		File-ER Document Management Center-RC	

To: Amy King
From: D.J. Awl

Date: August 18, 1994

Plant Survey Area: Research Park Natural Area 8: McCOY BRANCH
EMBAYMENT BARREN

Botanists: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: August 12, 15, 16, 1994

Status: Northern portion of NA was surveyed.

Results: The known population of tall larkspur (*Delphinium exaltatum*) was relocated. Tall larkspur is classified as endangered by the State of Tennessee and is a federal C2 candidate. This population is the site of a long-term study on the demography of tall larkspur. Data for this year was collected.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

Natural area 8 is located south of Bethel Valley Road. It runs approximately one half mile eastward from McCoy Branch Embayment of Melton Hill Reservoir. Part of the area is forested but it is transected by telephone, gasline, and powerline right-of-ways. Rocky outcrops are found throughout the site. Tall larkspur (*Delphinium exaltatum*) is found primarily in the mown right-of-ways of both the gasline and telephone line but is also found in scattered locations throughout the forested sections.

Tall larkspur is listed as endangered by Tennessee. It is also a federal C2 candidate. C2 candidate species are those species for which available information indicates they are threatened or endangered but for which substantial biological data is lacking. It is known to occur in 4 other locations on the reservation. A demographic study of tall larkspur was begun on this population in 1985. At that time 100 permanent plots were laid out, each marked by metal stakes. Each year the site has been revisited and the number of individuals in each plot counted. This year in addition to data collection, the stakes which mark each plot were examined. New tags and flagging were fitted to the stakes as needed.

The population is found in the telephone and gasline right-of-ways on a north-facing slope. Most of the population is found in the grassy area that is maintained by mowing. Common species in this area include little blue stem (*Andropogon gerardii*), nodding onion (*Allium cernuum*), thimbleweed (*Anemone virginiana*), indian grass (*Sorghastrum nutans*), ox-eye (*Heliopsis helianthoides*), lespedeza (*Lespedeza sp.*), goldenrod (*Solidago sp.*), blackberry (*Rubus sp.*), Japanese grass (*Eulalia viminea*), geranium (*Geranium sp.*), and Japanese honeysuckle (*Lonicera japonica*). There are scattered individuals of tall

larkspur in the forested areas south of the right-of-way also. This young forest is composed of such species as red cedar (*Juniperus virginiana*), chestnut oak (*Quercus muehlenbergii*), redbud (*Cercis canadensis*), Virginia pine (*Pinus virginiana*), black gum (*Nyssa sylvatica*), and white ash (*Fraxinus americana*).

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 9, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 11

On August 5, 1994, Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 11 (NA11): Bull Bluff. Four species of threatened or endangered species were identified at this site. The rare plants identified at this site include: Kearney's bugbane (*Cimicifuga rubifolia*; Federal C2 candidate, State of Tennessee threatened species), northern bush-honeysuckle (*Diervilla lonicera*; State of Tennessee threatened species), Carey Saxifrage (*Saxifraga careyana*; Federal C3 candidate, State of Tennessee species of special concern), and ginseng (*Panax quinquefolius*; Federal C3 candidate, State of Tennessee threatened species). The enclosed letter report discusses the survey findings in detail.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc:	T. L. Ashwood	D. J. Awl	L. B. Cobb	K. W. Cook
	L. T. Cusick	M. F. P. DeLozier	C. A. Gabrielsen	E. L. Hannahs
	A. C. Holder	R. K. Holmes	P. D. Parr	P. Phillips, DOE-ORO
	S. P. Riddle, DOE-ORO		File-ER Document Management Center-RC	

To: Amy King
From: D.J. Awl

Date: August 18, 1994

Plant Survey Area: Research Park Natural Area 11: BULL BLUFF

Botanist: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: August 5, 1994

Status: All of area surveyed.

Results: Rare plants occurring in this natural area are Kearney's bugbane (*Cimicifuga rubifolia*; federal C2 candidate, state threatened), northern bush-honeysuckle (*Diervilla lonicera*; state threatened), Carey saxifrage (*Saxifraga careyana*; federal 3C candidate, state special concern), and ginseng (*Panax quinquefolius*; federal 3C candidate, state threatened).

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

NA11 is located on a steep north-facing limestone bluff overlooking Melton Hill Lake. The slopes are forested except for cliff areas. It is registered as a state Natural Area.

Kearney's bugbane (*Cimicifuga rubifolia*) is found in the rocky area on the lower portion of the slope. Kearney's bugbane is a federal C2 candidate. These are species for which available information indicates that they should be listed as endangered or threatened but for which substantial data on biological vulnerability is not available. It is also listed by the state of Tennessee as threatened. There are approximately 500 individuals in this population.

Northern bush-honeysuckle (*Diervilla lonicera*) is found on the rock outcrop at the top of the slope. This rock outcrop widens as it goes eastward and becomes bull bluff. Northern bush-honeysuckle is state listed as threatened. About 150 clumps of northern bush-honeysuckle were visible from the base of the rock outcrop. However, the actual population size should be much larger as this number would not include plants at the top of the outcrop or on the bluff itself.

Carey saxifrage (*Saxifraga careyana*) is also found on the rock outcrop at the top of the slope. Individuals are scattered along the length of the outcrop. Given the amount of area they cover and the density in some places the population size should be over 2000. Carey saxifrage is a federal 3C candidate. These are species which have proven to be more abundant than previously thought. It is state listed as being of special concern. These plants are of concern because of their rarity in Tennessee or their status is undetermined because of insufficient information.

Ginseng (*Panax quinquefolius*) is also a federal 3C candidate

and is state-listed as threatened. Individuals are found scattered throughout the area. Population size was not estimated.

This site shows no sign of human disturbances such as logging. Some trees have diameters greater than 3 ft. dbh. However, tree fall is common on the steep, rocky slopes. Vegetation is typical of the mesic forests of the region. Tree species present include sugar maple (*Acer saccharum*), buckeye (*Aesculus flava*), chestnut oak (*Quercus muehlenbergii*), northern red oak (*Q. rubra*) and cucumber magnolia (*Magnolia acuminata*). Shrub and herbaceous species include spicebush (*Lindera benzoin*), pawpaw (*Asimina triloba*), jack-in-the-pulpit (*Arisaema triphyllum*), Solomon's seal (*Polygonatum biflorum*), crane-fly orchid (*Tipularia discolor*), stonecrop (*Sedum ternatum*), and maidenhair fern (*Adiantum pedatum*).

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

August 3, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 25

On July 21, 1994 Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 25 (NA25): Highway 95 Lily Area. The lily population was relocated, with a smaller number of plants located than during a survey three years ago. The population is either that of the Canada Lily (*Lilium Canadense*) or the Michigan Lily (*Lilium michiganense*). Further species identification requires the plant to be in flower; nevertheless, both species are listed as threatened by the state of Tennessee. The enclosed letter report discusses the current survey findings, including possible reasons for a decrease in population size.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

Nancy Hendrix-Ward

Page 2 of 2

August 3, 1994

cc/enc: D. J. Awl
H. L. Boston
L. B. Cobb
K. W. Cook
L. T. Cusick
M. F. P. DeLozier
C. A. Gabrielsen
E. L. Hannahs
A. C. Holder
R. K. Holmes
P. D. Parr
P. Phillips, DOE-ORO
S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

To: Amy King
From: D.J. Awl

Date: August 2, 1994

Plant Survey Area: Research Park Natural Area 25: HIGHWAY 95
LILY AREA

Botanists: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: July 21, 1994

Status: All of area surveyed.

Results: The lily population was relocated. The lilies have been identified vegetatively as either Canada lily (*Lilium canadense*) or Michigan lily (*L. michiganense*). Both of these species are listed by the state of Tennessee as threatened.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

NA25 is located west of Highway 95 just north of the road to O-800 area. A small stream runs approximately parallel to the highway. A small population of lilies are located immediately along the stream. The lilies have been identified vegetatively as either Canada Lily (*Lilium canadense*) or Michigan lily (*Lilium michiganense*). Flowering plants are needed to determine which of these two species are present. Both species are listed by the state of Tennessee as threatened. Only 3 plants were found. When the site was initially observed 3 years ago approximately 20 to 30 individuals were found. This could indicate a population decline for some unknown reason. However, it is also possible that most of the population has already become dormant for the year.

The wetland area along the stream in which the lilies are located is dominated by a combination of green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*). Understory species include Japanese grass (*Eulalia viminea*), quillwort (*Isoetes* sp.) and manna grass (*Glyceria striata*). The upland areas west of the wetland are dominated by white oak and white pine with some tulip poplar and shortleaf pine. A number of large trees are present. It has a diverse herbaceous ground cover with such species as lop-seed (*Phryma leptostachya*), trillium (*Trillium* sp.), Christmas fern (*Polystichum acrostichoides*) and Virginia creeper (*Parthenocissus quinquefolia*).

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

August 3, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 26

On July 28, 1994 Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 26 (NA26): Melton Valley Lily Area. Previously, a lily population was found, with two members of either the Canada Lily (*Lilium Canadense*) or the Michigan Lily (*Lilium michiganense*). Both of these species are listed as threatened by the state of Tennessee. On this survey; however, no lilies were located. The enclosed letter report discusses possible reasons for not relocating the lilies at the Melton Valley Lily Area.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc: D. J. Awl	H. L. Boston	L. B. Cobb	K. W. Cook
L. T. Cusick	M. F. P. DeLozier	C. A. Gabrielsen	E. L. Hannahs
A. C. Holder	R. K. Holmes	P. D. Parr	P. Phillips, DOE-ORO
S. P. Riddle, DOE-ORO		File-ER Document Management Center-RC	

To: Amy King
From: D.J. Awl

Date: August 2, 1994

Plant Survey Area: Research Park Natural Area 26: MELTON VALLEY
LILY AREA

Botanists: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: July 28, 1994

Status: All of area surveyed. Area should be resurveyed during the spring of 1995.

Results: The site is the known location of a lily population. These plants have been identified vegetatively as either Canada lily (*Lilium canadense*) or Michigan lily (*L. michiganense*). Both of these species are listed by Tennessee as threatened. The population was not relocated.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

NA26 is located just south of Melton Valley Drive east of the entrance to HFIR. Previously 2 lilies were found here. Those plants were identified vegetatively as either Canada lily (*Lilium canadense*) or Michigan lily (*L. michiganense*). Flowering individuals are needed to determine which species is present. Both species are state listed as threatened. No lilies were found during this visit. It is probable that either the lilies have already become dormant for the year or they were simply missed. This site should be revisited in late spring or early summer next year before lilies start becoming dormant.

The natural area is a small, forested wetland. Red maple (*Acer rubrum*) dominates with green ash (*Fraxinus pennsylvanica*) also common. Japanese grass (*Eulalia viminea*) covers most of the ground. However, cattails (*Typha latifolia*), cutgrass (*Leersia virginica*), clearweed (*Pilea pumila*) and sedges (*Carex* sp.) are also present. The uplands adjacent to the wetland are forested with small trees (most less than 1.5 ft. dbh.). Tree species in these uplands include sweetgum (*Liquidambar styraciflua*), red maple, Virginia pine (*Pinus virginiana*), red cedar (*Juniperus virginiana*), white oak (*Quercus alba*), and dogwood (*Cornus florida*).

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 9, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 27

During July 1994, Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 27 (NA27): Fringeless Orchid Wetlands. Three populations of purple fringeless orchid were re-identified and the number of individuals were counted. The purple fringeless orchid is a State of Tennessee threatened species. The enclosed letter report discusses the survey findings in detail.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc: T. L. Ashwood	D. J. Awl	L. B. Cobb	K. W. Cook
L. T. Cusick	M. F. P. DeLozier	C. A. Gabrielsen	E. L. Hannahs
A. C. Holder	R. K. Holmes	P. D. Parr	P. Phillips, DOE-ORO
S. P. Riddle, DOE-ORO		File-ER Document Management Center-RC	

To: Amy King
From: D.J. Awl

Date: August 18, 1994

Plant Survey Area: Research Park Natural Area 27: FRINGELESS ORCHID WETLANDS

Botanists: Rebecca Cook, Ph.D., The University of Tennessee; Larry Pounds, JAYCOR

Field Survey Dates: July 25, 29 1994

Status: All of area surveyed. Area should be revisited next spring to see if the site has been impacted by activities in the area.

Results: Three populations of purple fringeless orchid (*Platanthera peramoena*), a state-listed species were relocated and the number of flowering individuals were counted.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

NA27 is located in and immediately adjacent to the Bear Creek powerline right-of-way. It extends eastward from Flannigan's Loop Road. In *Resource Management Plan for the Oak Ridge Reservation*, Volume 30, NA27 is shown as being located west of Flannigan's Loop Road.

The purple fringeless orchid (*Platanthera peramoena*) is found in some of the wet areas located between the ridges in NA27. This species is listed by the State of Tennessee as being threatened. Three populations of the purple fringeless orchid were relocated. Due to the very thick vegetation in the wetlands where these are located only the flowering individuals were counted. In the most eastern population 10 individuals were found. In the middle population 4 individuals were located. In the most western populations 6 flowering individuals were present. In many herbaceous plant populations, only a small percentage of the individuals will be capable of flowering while most individuals will be either juveniles or seedlings. Because of this it is thought that the actual number of individuals is probably much larger.

Vegetation in all three of the orchid wetlands is very similar. Common species include rushes (*Juncus effusus* and *J. biflorus*), cattail (*Thypha latifolia*), phlox (*Phlox carolina*), wild rye grass (*Elymus virginicus*), panicgrass (*Panicum sp.*), Japanese honeysuckle (*Lonicera japonica*), hog peanut (*Amphicarpa bracteata*), groundnut (*Apios americana*), cardinal flower (*Lobelia cardinalis*), black willow (*Salix nigra*), and red maple (*Acer rubrum*).

Bear Creek Powerline right-of-way is dominated by grasses and other herbaceous species. Periodic mowing has prevented the establishment of trees, although some small saplings are present.

In the drier areas on the tops and sides of ridges common species include little blue stem (*Andropogon scoparius*), broom sedge (*Andropogon virginicus*), ragweed (*Ambrosia* sp.), Lobelia (*Lobelia spicata*), pycnanthemum (*Pycnanthemum tenuifolium* and *P. incanum*), butterfly pea (*Clitoria mariana*), Virginia pine (*Pinus virginiana*), smooth sumac (*Rhus glabra*) and blackberry (*Rubus* sp.) This natural area is also the only known site on the Oak Ridge Reservation for the blazing star species of *Liatris spicata*.

Recently there has been activity in and near NA27 related to both monitoring well access and the logging of pine bark beetle infested pine stands. In one place an old existing road across the right-of-way was widened and graveled. At the eastern end of the natural area vehicles associated with logging activities have used the right-of-way as access to pine stands, leaving large ruts in the right-of-way. Road construction or logging in areas nearer the purple fringeless orchid sites could result in the destruction of the sites either directly or indirectly (erosion and silting).

cc: P. Parr
B. Rosensteel

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

August 3, 1994

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

The Threatened and Endangered Plant Species Survey of Research Park Natural Area 29

On July 21 1994 Dr. Rebecca Cook, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of Research Park Natural Area 29 (NA29): Rocky Limestone Forest. No rare plants were found at this site. The enclosed letter report outlines the survey area and identifies the vegetation found at RA29.

An interim report of findings is scheduled for completion on October 31, 1994, until then I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Remedial Action Integration
Environmental Restoration Division

Enclosure

cc/enc:	D. J. Awl	H. L. Boston	L. B. Cobb	K. W. Cook
	L. T. Cusick	M. F. P. DeLozier	C. A. Gabrielsen	E. L. Hannahs
	A. C. Holder	R. K. Holmes	P. D. Parr	P. Phillips, DOE-ORO
	S. P. Riddle, DOE-ORO		File-ER Document Management Center-RC	

To: Amy King
From: D.J. Awl

Date: August 2, 1994

Plant Survey Area: Research Park Reference Area 29: ROCKY
LIMESTONE FOREST

Botanists: Rebecca Cook, Ph.D., The University of Tennessee

Field Survey Dates: July 21, 1994

Status: All of area surveyed.

Results: No rare plant species found.

Note: Locations of species and areas discussed are indicated on the attached map. Locations of rare plants should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: Rebecca Cook, Ph.D.

Reference Area 29 is located on Haw Ridge south of the main ORNL complex. RA29 was checked to ensure that none of the expansion projects in the area were encroaching. All activities are currently located outside of RA29.

RA29 is dominated by white oak (*Quercus alba*) with northern red oak (*Q. rubra*), southern red oak (*Q. falcata*) and yellow oak (*Q. muehlenbergii*) as well as Virginia pine (*Pinus virginiana*), red cedar (*Juniperus virginiana*) and tulip poplar (*Liriodendron tulipifera*). Understory species include sourwood (*Oxydendrum arboreum*), blueberry (*Vaccinium* sp.), white pine (*Pinus strobus*) and dogwood (*Cornus florida*).

cc: P. Parr
B. Rosensteel

LTR.#PIA-TO/93-090

I TIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

July 23, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Nancy:

Threatened and endangered plant species survey of the South Campus Facility Operable Unit

On June 25, 1993, Larry Pounds, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the South Campus Facility Operable Unit. Mr. Pounds found no listed plant species at that site. A general description of the field survey, with results, is enclosed for your information. Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 615-576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Reservation-Wide Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK

Enclosure

cc/enc: D. T. Bell
P. D. Parr
S. P. Riddle, DOE-ORO

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr

Date: July 23, 1993
Subject: South Campus Facility OU

Plant survey area: **South Campus Facility OU**

Botanist: Larry R. Pounds, The University of Tennessee

Field survey dates: 1993 June 25.

Status: Entire area has been surveyed.

Results: No listed plant species were found.

Note: Locations of species and areas discussed are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: P. D. Parr, ESD.

General description:

The area is bounded by the Pump House Road, Bethel Valley Road, and Scarboro Creek (including an area of embayment). Most of the area is in lawns and buildings. The cemetery is predominantly under tree cover. Along the embayment are areas of wetlands dominated by Scirpus species and Juncus species. A wetland species of Iris occurs in one of these wetlands just outside the South Campus Facility OU. The irises were past flowering making species identification difficult. Wetland species of Iris are rare on the ORR. This species has not been identified to species at this time, and it may be June of next year before the identification can be accurately made.

There are three steeply banked ponds with little wetland vegetation located at the southeast corner of the OU (circled on the map).

Scarboro Creek is an Aquatic Reference Area (ARA 7) along the east side of the South Campus OU. A sewer is overflowing and polluting Scarboro Creek near ARA 7. This information was given to Mike Ryon, ESD who contacted the City of Oak Ridge. He had contacted them regarding this same situation earlier.

Just outside the South Campus OU are two very large trees (ash and walnut). These are east of Scarboro Creek across a bridge. Near the embayment are thickets of blackberries, sumac, and other species. Purple loosestrife is found along Scarboro Creek and along the embayment. This alien species has displaced native species in wetlands in the northern U. S. At present the species does not seem to be a problem on South Campus OU but it should be monitored.

cc: Larry Pounds Barbara Rosensteel

LTR.#PIA-TO/93-121

M. IN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831

September 21, 1993

Nancy Hendrix-Ward
U. S. Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

Threatened and endangered plant species survey of the Upper East Fork Poplar Creek Operable Unit 1

On September 7, 1993, Mr. Larry Pounds, of the Environmental Sciences Division, completed the threatened and endangered plant species survey of the Upper East Fork Poplar Creek (UEFPC) Operable Unit (OU) 1. UEFPC OU 1 south of Bear Creek Road was surveyed as part a Y-12 project and was not revisited this year. UEFPC OU 1 north of Bear Creek was visually surveyed on April 30 and September 7, 1993. Results from the surveys of the UEFPC OU 1 are enclosed.

Upon completion of the entire Oak Ridge Reservation (ORR), a report will be issued documenting all survey sites on the ORR; until that time I will continue to send you site-by-site results. Please call me at 576-1509, if you have any questions.

Sincerely,

Amy King, Manager
Remote Sensing and Special Surveys Program
Technical Oversight
Program Integration & Administration Division

ADK:SRC

Enclosure

cc/enc: D. T. Bell
L. B. Cobb
M. F. P. DeLozier
J. T. Grumski
P. D. Parr

S. P. Riddle, DOE-ORO
File-ER Document Management Center-RC

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

To: Amy King
From: Pat Parr

Date: September 14, 1993
Subject: UEFPC OU 1

Plant survey area: **UEFPC OU 1**

Botanists: Larry Pounds, The University of Tennessee.

Field survey dates: 1993: April 30, September 7.

Status: Survey of area is complete.

Results: One rare plant population was found in the OU.

Note: Locations of species and areas discussed are indicated on attached map. Locations of rare plant species should be considered sensitive information and distributed on a need-to-know basis only.

Report prepared by: P. D. Parr, ESD.

General description: The Upper East Fork Poplar Creek (UEFPC) OU 1 area is highly developed (buildings, parking lots and lawns) except for parts of Chestnut Ridge south of Y-12 and parts of Pine Ridge north of Y-12.

UEFPC OU 1 south of Bear Creek Road was looked at in January 1992 as a part of a survey of developed areas for Y-12. In the 1992 survey, there were no rare plants found south of Bear Creek Road, although there was suitable habitat for two state listed species, Ginseng (Panax quinquefolius) and Lesser Ladies Tresses (Spiranthes ovalis). A copy of the 1992 survey is attached.

North of Bear Creek Road most of the trees have been cleared to the top of Pine Ridge. Additionally, much of the area is maintained by mowing, not habitat for rare plants. Existing forests are predominantly oak. Pink lady slipper (Cypripedium acuale), state endangered, was found on the extreme west end of the UEFPC OU 1. The population was small with two flowering plants and several non-flowering plants. It is marked on the map.

cc: Barbara Rosensteel

**ENVIRONMENTAL SCIENCES DIVISION
National Environmental Research Park**

RESULTS OF THE Y-12 AREA RARE PLANT AND WETLAND SURVEY

Carol Hardy, Larry Pounds, and Rebecca Cook

January 1992

SECTION ONE.

PHASE I AREA

HABITAT DESCRIPTION

Most of this area is dominated by buildings, parking lots and lawns, and thus little natural vegetation. Almost all of the natural vegetation present was on Chestnut Ridge (see map 2). There were also some small forested areas in the valley. Overstory vegetation was dominated by various Oak species (see appendix I for scientific names of species mentioned in this report). The west end of forested area #3 had some large individual Beeches and Oaks. Rocky outcrops were also present. The herbaceous, ground level vegetation was dominated by Japanese honeysuckle in many forested areas, which is common on the Reservation. However, a few forested areas supported a surprising variety of native vegetation.

RARE PLANTS PRESENT

No rare plants were found in the Phase I area. The forested areas on Chestnut Ridge do, however, appear to be suitable habitat for two state listed species, Ginseng and Lesser ladies-tresses. The draft document *Rare Plants on the Oak Ridge Reservation* (see appendix VIII) states that Ginseng and Lesser ladies-tresses occur in rich, moist woods and can be found growing in association with each other. Eight sites for ginseng were seen during the survey of Chestnut Ridge west of the Phase I area (see section three of this report). Ginseng is state-listed as threatened due to heavy commercial exploitation for its reputed medicinal properties; it would be fairly common otherwise. One possible Lesser ladies-tresses plant was also noted on Chestnut Ridge to the west of the Phase I area. The plant could not be located when checked later for flowering to confirm its identification. It may have died back without flowering, which is common. Lesser ladies-tresses is state-listed as a species of special concern. However, it is very inconspicuous and may be more common than previously thought.

WETLANDS PRESENT

Wetlands were surveyed and identified using guidelines established in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (U.S. Interagency Cooperative Publication, January 1989, see Appendix XI). Section five of this report contains a more thorough discussion on wetlands identification and the wetlands of the Y-12 area in general.

Two small areas of wetland were found in the Phase I area (see map 2). Wetland A included a small pond and stream surrounded mostly by a small forest. Less than .4 acres in size, Wetland A was dominated by Sedges along the edges of the pond, and

Cutgrass where the stream entered the pond (see appendices III and IV for wetland classification. Wetland B occurred along a section of Bear Creek, where the drainage border widened into a marsh dominated by cattails. Approximately 30 ft. in diameter, this wetland was previously described in another survey (see appendix V).

ADDITIONAL COMMENTS

The areas in Phase I that are not identified as having significant natural vegetation or wetlands should require no further surveying for rare plants or wetlands. Exceptions to this case would be areas where natural vegetation had been allowed to re-establish or if a drainage would be altered, creating the possibility of wetland development. Those areas in Phase I identified as having significant natural vegetation do have the potential to support two state-listed species. If any of these areas are targeted for development in the future, a resurvey of that particular area is recommended.

APPENDIX B

Gasline Road Survey Summary
Sites 1 and 2

The Gasline Road is a 20-meter wide stretch of grass and shrub that runs through a mixed pine/hardwood forest. The area is dominated by pine trees to the south and deciduous trees to the north. Canopy trees stand approximately 10 to 15 meters high.

MAY- On 5/19/94 the Gasline Road was surveyed for bird activity. The high for the day was 67° F and the low was 47° F. There was no precipitation. Seven samples of avian activity were taken. Samples were spaced 160 meters apart, and they ran 15 minutes each. Species observed include: Indigo bunting (*Passerina cyanea*), American crow (*Corvus brachyrhynchos*), Common grackle (*Quiscalus quicula*), Mourning dove (*Zenaida macroura*), Red-eyed vireo (*Vireo olivaceus*), Cedar waxwing (*Bombycilla cedrorum*), Barn swallow (*Hirundo rustica*), Yellow-billed cuckoo (*Coccyzus americanus*), Northern Cardinal (*Cardinalis cardinalis*), Great blue heron (*Ardea herodias*), **Black vulture** (*Coragyps atratus*), and **Red-shouldered hawk** (*Buteo lineatus*).

JULY- On 7/7/94 20 boards were placed along Gasline Road to attract small mammals, reptiles, and amphibians. The boards were checked on 7/20/94, but no animals were found (high/low temp 87/71°F).

0855 Building Road Survey Summary
Site 3

Site 3 is along the road to Building 0855. The area is an open field consisting of grasses, blackberry bushes, and small trees that are 1-2 meters in height. It is bordered by a pine/hardwood forest that stands 20 to 30 meters. There is considerable human activity in the area.

MAY- On 5/25/94 Site 3 was surveyed for bird activity. The high for the day was 84° F and the low was 65° F. There was no precipitation. Species observed include: Field sparrow (*Spizella pusilla*), Indigo bunting (*Passerina cyanea*), Red-eyed vireo (*Vireo olivaceus*), European Starling (*Sturnis vulgaris*), American Crow (*Corvus brachyrhynchos*), Great blue heron (*Ardea herodias*), Prairie warbler (*Dendroica discolor*), Gold finch (*Carduelis tristis*), Belted kingfisher (*Megasceryle alcyon*), Red-bellied woodpecker (*Melanerpes carolinus*), Canada geese (*Branta canadensis*), Northern bobwhite (*Colinus virginianus*), Blue-gray gnatcatcher (*Poliophtila caerulea*), Rufus-sided towhee (*Pipilo erythrophthalmus*), Pileated woodpecker (*Dryocopus pileatus*), Common grackle (*Quiscalus quicula*), Northern cardinal (*Cardinalis cardinalis*), and Northern parula (*Parula americana*).

JUNE- No surveys were conducted. Species observed in passing: Green frog (*Rana clamitans melanota*), Gray tree frog (*Hyla chrysoscelis*), American toad (*Bufo americanus*), raccoon (*Procyon lotor*).

JULY- No surveys were conducted, but common species were observed.

*Due to frequent use of Building 0855, certain species are constantly observed at the site. Species observed include: White-tailed deer (*Odocoileus virginianus*), Eastern cottontail rabbit (*Sylvilagus floridanus*), groundhog (*Marmota monax*), Field sparrow (*Spizella pusilla*), and Eastern wild turkey (*Meleagris gallopavo*).

Jones Island Survey Summary
Sites 4,5,and 6

Sites 4, 5, and 6 are along Jones Island Road. The area has a deciduous forest to the north and is bordered by the Clinch River to the south. The trees are approximately 20 to 30 meters in height. There is a diverse understory throughout the sites.

MAY- On 5/31/94 (Site 4) bird surveys were conducted. The high for the day was 85° F and the low was 61° F. There was no precipitation. Species observed include: Northern parula (*Parula americana*), Red-eyed vireo (*Vireo olivaceus*), American crow (*Corvus brachyrhynchos*), Indigo bunting (*Passerina cyanea*), Pileated woodpecker (*Dryocopus pileatus*), Rufus-sided towhee (*Pipilo erythrophthalmus*), Great blue heron (*Ardea herodias*), Northern cardinal (*Cardinalis cardinalis*), Northern bobwhite (*Colinus virginianus*), King fisher (*Ceryle alcyon*), Swallow (*Hirundinidea*), Downy woodpecker (*Picoides pubescens*), Yellow-billed cuckoo (*Coccyzus americanus*), Wood thrush (*Hylocichla mustelina*), Tufted titmouse (*Parus bicolor*), Blue jay (*Cyanocitta cristata*), Wood duck (*Aix sponsa*), Eastern phoebe (*Savornis phoebe*), Prairie warbler (*Dendroica discolor*), and Chipping sparrow (*Spizella passerina*).

JUNE- On 6/1/94 (Site 5) and 6/2/94 (Site 6) bird surveys were conducted. The average high/low temperatures were 87.5/63 °F and there were 0.4 in. of precipitation. Additional species observed in the area include: Meadowlark (*Sternella magna*), **Black-crowned night-heron** (*Nycticorax Nycticorax*), Cliff swallow (*Hirundo pyrrhonota*), Carolina chickadee (*Parus carolinensis*), and White-eyed vireo (*Vireo griseus*). A beaver (*Castor canadensis*) was seen along the road at site 4 on 6/6/94.

JULY- No bird surveys were conducted. One unidentified slider (*Chrysemys scripta*) was found in a turtle trap in Raccoon creek on 6/14/94 (high/low temp 88/67 °F).

0800 Building Area Survey Summary
Site 7

Site 7 included the area around Building 0800. The site is an old field surrounded by a mixed pine/hardwood forest. The trees stand approximately 20 to 30 meters high.

JUNE- A bird survey was conducted on 6/7/94. The high/low temperatures were 87/68°F and there were 0.12 inches of rain. Species observed include: Pileated woodpecker (*Dryocopus pileatus*), Blue-gray gnatcatcher (*Polioptila caerulea*), Indigo bunting (*Passerina cyanea*), Red-eyed vireo (*Vireo olivaceus*), Common grackle (*Quiscalus quicula*), Red-bellied woodpecker (*Melanerpes carolinus*), Wood thrush (*Hyocichla mustelina*), Blue jay (*Cyanocitta cristata*), Northern Cardinal (*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), and Chipping sparrow (*Spizella passerina*).

Muskrat Marsh Survey Summary
Site 8

Site 8 is a marshy area that borders the Clinch River. It is surrounded by a mixed pine/hardwood forest that stands approximately 20 to 30 meters high. The understory consists of spice bush, hedge privet, greenbriar, and poison ivy. There is a large amount of water fluctuation in this area due to water level regulation of the Clinch River. It is possible that this large fluctuation in water levels affects animal activity.

JUNE- On 6/3/94, 150 Sherman mammal traps were placed in four transects around the area. Boards were also placed around the area to attract various small mammals, reptiles, and amphibians. The mammal traps were open for three consecutive nights (6/6/94 to 6/8/94) and collected on the morning of 6/9/94. The high/low temperatures were 84/65°F. Mammals caught included: Deer mouse (*Peromyscus maniculatus*), Golden mouse (*Peromyscus nuttalli*), Short-tailed shrew (*Blarina brevicauda*), and Meadow vole (*Microtus pennsylvanicus*). A beaver (*Castor canadensis*) was also observed in the area. The boards were checked on 6/6/94, and one Northern ringneck snake (*Diadophis punctatus*) was found (high/low temp 82/68°F).

JULY- On 7/1/94, two turtle traps were placed in the marsh, and no turtles were captured in these traps. In the month of July three Eastern worm snakes (*Carphophis amoenus amoenus*), a Five-lined skink (*Eumeces fasciatus*), and two Northern ring neck snakes (*Diadophis punctatus*) were found under the boards.

AUGUST- Boards were checked on 8/9/94, and one Northern ringneck was captured (high/low temp 88/65°F).

Detailed Site Summary

Muskrat Marsh

Site 8

6/6-6/10

Muskrat marsh is a wetland area with a mixed pine/hardwood overstory of approximately 10 meters. The understory consists of box elder, spice bush, hedge privet, jewel weed, and poison ivy. Extreme water fluctuation occurs at this marsh due to water level regulation of the Clinch River. It is possible that this fluctuation effects animal activity in the area.

Boards were also placed around the transects to attract various small mammals, reptiles, and amphibians. Sherman live traps were set along the transects and opened for three consecutive nights (Monday, Tuesday, Wednesday). The traps were checked periodically throughout the night.

Monday traps were opened and baited around 1800 and closed at 0430 Tuesday morning. The traps were checked four times through the course of the night. Six deer mice (*Peromyscus maniculatus*), and 1 Golden mouse (*Peromyscus nuttalli*) were captured. Tuesday night the traps were opened at 1914 and were closed at 0430 Wednesday morning. The traps were checked three times and four deer mice, two Golden mice, one Short-tailed shrew (*Blarina brevicauda*), and one Meadow vole (*Microtus pennsylvanicus*) were captured. Wednesday night the traps were opened at 1753 and they were collected at 0400 Thursday morning. During the night the traps were checked six times and 3 Deer mice were captured.

During the trapping session several different animals were observed in the area. Species observed include: beaver (*Castor canadensis*), Ringneck snake (*Diadophis punctatus*), Green frog (*Rana clamitans melanota*), Gray tree frog (*Hyla chrysoscelis*), Northern Cardinal (*Cardinalis cardinalis*), Indigo bunting (*Passerina amonea*), Blue-gray gnat catcher (*Poliopylla caerulea*), Carolina chickadee (*Parus carolinensis*), Yellow billed cuckoo (*Coccyzus americanus*), and Chipping sparrow (*Spizella passerina*).

Freels Bend Survey Summary
Sites 9, 10, 22 and 24

Sites 9 and 10 are the areas where the bird surveys were conducted near Freels Bend. This area consists of grassland and edge habitat with brush and small trees.

JUNE- Bird surveys were conducted on 6/8/94 and 6/9/94. The average high/low temperatures were 82.5/67.5°F. There was a total of 0.11 inches of rain on 6/8-6/9/94. Species observed include: Indigo bunting (*Passerina cyanea*), Northern Cardinal (*Cardinalis cardinalis*), Tufted titmouse (*Parus bicolor*), Red-eyed vireo (*Vireo olivaceus*), Northern bobwhite (*Colinus virginianus*), Carolina chickadee (*Parus carolinus*), Blue-gray gnatcatcher (*Poliophtila caerulea*), Great blue heron (*Ardea herodias*), American crow (*Corvus brachyrhynchos*), Mourning dove (*Zenaida macroura*), Red-bellied woodpecker (*Melanerpes carolinus*), Solitary vireo (*Vireo solitarius*), Yellow-billed cuckoo (*Coccyzus americanus*), Eastern Phoebe (*Savornis phoebe*), Chipping sparrow (*Spizella passerina*), **Black Vulture** (*Coragyps atratus*), Wood thrush (*Hylocichla mustelina*), Eastern bluebird (*Sialia sialis*), Red-winged blackbird (*Agelaius phoeniceus*), **Black-crowned night-heron** (*Nycticorax nycticorax*), Green heron (*Butorides striatus*), Rufus-sided towhee (*Pipilo erythrophthalmus*), Northern parula (*Parula americana*), Downy Woodpecker (*Picoides pubescens*), Acadian flycatcher (*Empidonax virescens*), Barn swallow (*Hirundo rustica*), Rough-winged swallow (*Stelgidopteryx serripennis*), and American goldfinch (*Carduelis tristis*).

On 6/31/94, a bat was seen near the spring house, and a cave was located just off the road behind the spring house.

JULY- On 7/6/94, bats were sighted around the spring house at Freels Bend. The high/low temperature was 82/68 °F, and there were 0.02 in. of rain.

A bird survey was conducted on 7/26/94 (site 22) the high/low temperatures were 75/65 °F, and there were 1.27 in. of rain. No new species of birds were heard.

On 8/8/94, a drift fence with pitfall traps was constructed (Site 24).

Bull Bluff Survey Summary
Sites 11,12,13,and 14

The Bull Bluff area consists of a mixed pine/hardwood forests that borders old field areas. Site 11 consists of a grassy field with patches of blackberry bushes that is bordered to the southeast by the Clinch River. Site 12 consists of old field with tall grasses, blackberry, and sumac. It is also bordered by the Clinch River to the southeast. Sites 13 and 14 are inside the deciduous forest that stands 20 to 30 meters high.

JUNE- On 6/10/94, 300 Sherman small mammal traps were set in sites 11 and 12. The traps were open for 3 nights in a row for 2 weeks, then collected on 6/23/94. The high/low temperatures were 90/69 °F. Mammals trapped in this area include: Hispid cotton rat (*Sigmodon hispidus*) and Eastern harvest mice (*Reithrodontomys humulis*).

Boards were also set up around the transects to attract small mammals, reptiles, and amphibians.

Birds heard while trapping include: Great horned owl (*Bubo virginianus*), Barred owl (*Strix varia*), and Great blue heron (*Ardea herodias*). Sites 13 and 14 were bird surveys done in the same vicinity as the mammal trapping sites. Observations included: Indigo bunting (*Passerina cyanea*), Northern cardinal (*Cardinalis cardinalis*), Yellow-billed cuckoo (*Coccyzus americanus*), Blue-gray gnatcatcher (*Poliophtila caerulea*), Red-eyed vireo (*Vireo olivaceus*), Chickadee (*Parus carolinensis*), Blue jay (*Cyanocitta cristata*), Tufted titmouse (*Parus bicolor*), Red-bellied woodpecker (*Melanerpes carolinus*), Pileated woodpecker (*Dryocopus pileatus*), White-eyed vireo (*Vireo griseus*), American crow (*Corvus brachyrhynchos*), Pine warbler (*Dendroica pinus*), Rufus-sided towhee (*Pipilo erythrophthalmus*), and Red-headed woodpecker (*Melanerpes erythrocephalus*).

A drift fence with pitfall traps was constructed between sites 11 and 12 on 6/22/94.

JULY- In the month of July, the boards were checked once a week. Nine Northern brown snakes (*Storeria dekayi dekayi*), and a Northern ringneck snake (*Diadophis punctatus*) were found in July. On 6/19/94, an Eastern box turtle (*Terrapene carolina carolina*) was found in the pitfall trap (high/low temp 87/67 °F).

AUGUST- On 8/9/94, a Northern brown snake was found under the boards (high/low temp 88/65 °F).

**Bull Bluff
Sites 11 and 12
6/13-6/16 and 6/20-6/23**

Three hundred Sherman livetraps were set on six transects (three transects per site) with 50 traps per transect.

Map showing a road with insect traps. The road is a curved line. Traps are marked with numbers indicating the number of insects caught at each location.

Traps along the road (from left to right):

- Trap 1: 5 (top), 4 (bottom)
- Trap 2: 2 (top), 4 (bottom)
- Trap 3: 2 (top), 4 (bottom)
- Trap 4: 2 (top), 4 (bottom)
- Trap 5: 2 (top), 4 (bottom)
- Trap 6: 1 (top), 2 (bottom)

Traps to the right of the road (from top to bottom):

- Trap 7: 4 (top), 2 (middle), 4 (bottom)
- Trap 8: 4 (top), 2 (middle), 4 (bottom)
- Trap 9: 4 (top), 2 (middle), 4 (bottom)
- Trap 10: 4 (top), 2 (middle), 4 (bottom)
- Trap 11: 2 (top), 4 (middle), 2 (bottom)

Legend: (Numbers indicate number of traps at each location.)

Note: These transects varied in length.

(Numbers indicate the number of traps at each location.)

Detailed Site Summary, continued

Bull Bluff
Sites 11 and 12
6/13-6/16 and 6/20-6/23

Boards were also placed around the transects to attract various small mammals, reptiles, and amphibians. Traps were set for three consecutive nights (Monday evening through Thursday morning). Trapping was conducted at this site for two weeks instead of one because of inclement weather.

Monday, 6/13, the traps were opened at 2130 and closed at 0400 Tuesday morning. Traps were checked once (a storm prevented further checking), and no mammals were captured. Tuesday evening the traps were opened at 2115 and closed at 0500 Wednesday morning. The traps were checked four times, and no mammals were captured. Wednesday evening the traps were opened at 1910 and closed at 0400 Thursday morning. The traps were checked four times, and one Cotton rat (*Sigmodon hispidus*) was captured.

Monday of the second week, 6/20, the traps were opened at 2200 and closed at 0530 on Tuesday morning. Traps were checked five times, and two Harvest mice (*Reithrodontomys humulis*) were captured. Tuesday evening the traps were opened at 1925 and closed at 0530 Wednesday morning. The traps were checked three times, and no mammals were captured. Wednesday evening the traps were opened at 2030 and closed at 0530 Thursday morning. Traps were checked three times, and no mammals were captured.

General observations were made of animal activity during the two weeks at Bull Bluff. Species observed include: Barred owl (*Strix varia*), Great horned owl (*Bubo virginianus*), Great blue heron (*Ardea herodias*), Mourning dove (*Zenaida macroura*), Indigo bunting (*Passerina amoena*), Tufted titmouse (*Parus bicolor*), American crow (*Corvus brachyrhynchos*), Blue-gray gnatcatcher (*Polioptila caerulea*), Northern parula (*Parula americana*), Pileated woodpecker (*Dryocopus pileatus*), Red-eyed vireo (*Vireo olivaceus*), Blue jay (*Cyanocitta cristata*), White-eyed vireo (*Vireo griseus*), Rufous-sided towhee (*Pipilo erythrophthalmus*), Canadian goose (*Branta canadensis*), and Summer tanager (*Piranga rubra*).

Shepherd Cemetery (and surrounding area) Survey Summary
Sites 15 and 16

Sites 15 and 16 are areas surrounding Shepherd Cemetery. The area is a deciduous forest bordered to the southeast by Melton Hill Lake. The trees stand approximately 20 to 30 meters. The ground vegetation includes poison ivy, Virginia creeper, and greenbriar.

JUNE- On 6/24/94, six transects of Sherman mammal traps were set around the area. Three transects of 50 traps were set in each area. Over the course of three nights, the traps were set and then collected on the morning of the fourth day. While the traps were opened, the high/low temperature was 84/67 °F. Mammals caught include: White-footed mouse (*Peromyscus leucopus*), Pine vole (*Microtus pinetorum*), and Eastern chipmunk (*Tamias striatus*).

Boards were also set along the transects to attract small mammals, reptiles and amphibians. A Northern copperhead (*Agkistrodon contortrix mokasen*) was seen on one of the transects. Turtle traps in the river produced an unidentified slider (*Chrysemys scripta*). Woodland salamanders (*Plethodon*) and Eastern spadefoot toads (*Scaphiopus holbrooki holbrooki*) were also found in the area.

Birds recorded include the Yellow-billed cuckoo (*Coccyzus americanus*), Wood thrush (*Hylocichla mustelina*), and Great horned owl (*Bubo virginianus*).

JULY- In the month of July, the boards were checked once a week. Three Eastern worm snakes (*Carphophis amoenus amoenus*), one ground skink (*Leiopisma laterale*), one White-footed mouse (*Peromyscus leucopus*), and one Southern leopard frog (*Rana utricularia*) were observed.

Detailed Site Summary

Shephard's Cemetery

Sites 15 and 16

6/27-6/30

Shephard's Cemetery is a hardwood forest bordered to the Southeast by the Clinch River. The trees stand 20 to 30 meters high. The understory consists of poison ivy, greenbriar, nepal grass, and considerable leaf litter.

Site 15 consisted of three transects:

Road

(Numbers indicate number of traps at each location.)

Site 16 consisted of three transects:

(Numbers indicate the number of traps at each location.)

Road

Detailed Site Summary, continued

Shephard's Cemetery
Sites 15 and 16
6/27-6/30

Six 50-meter transects were set out in the area. The transects each contained 50 Sherman livetraps. Boards were also placed around the transects to attract various small mammals, reptiles, and amphibians.

Monday, 6/27, the traps were opened at 1800 and closed at 0600 Tuesday morning. The traps were checked three times, and three White-footed mice (*Peromyscus leucopus*) were captured. Tuesday evening the traps were opened at 1800 and closed at 0500 Wednesday morning. The traps were checked three times, and two White-footed mice (*Peromyscus leucopus*) were captured. Wednesday evening the traps were opened at 2000 and closed and collected at 0630 Thursday morning. The traps were checked three times, and four White-footed mice (*Peromyscus leucopus*), one Pine vole (*Microtus pinetorum*), and one Eastern chipmunk (*Tamias striatus*) were captured.

General observations were made on the two sites at Shephard's Cemetery. Species observed include: Great horned owl (*Bubo virginianus*), Yellow billed cuckoo (*Coccyzus americanus*), Wood thrush (*Hylocichla mustelina*), Woodland salamanders (*Plethodon*), Eastern spadefoot toad (*Schphiopus holbrooki holbrooki*), Northern copperhead (*Agkistrodon contortrix mokasen*), and unidentified sliders (*Chrysemys scripta*).

McNew Hollow Survey Summary
Site 17

McNew Hollow is a deciduous forest area with a creek running through it. The overstory is approximately 20 to 30 meters high with sparse undergrowth of briars and poison ivy.

JULY- On 7/8/94, two drift fences with pitfall traps were placed. Boards were also placed around the area. Pitfall traps are opened in the morning and closed in the evening, and the boards are checked about once a week. Pitfall traps were opened during the day beginning 6/23/94. Two American toads (*Bufo americanus*) were found in the traps. The boards were checked once a week during July and a Northern ringneck snake (*Diadophis punctatus*) and an Eastern worm snake (*Carphophis amoenus amoenus*) were found.

Check Station Survey Summary
Site 18

Site 18 is a grassland area with sparse patches of blackberry bushes. The field is bordered by deciduous trees that stand 20 to 30 meters high. A small inlet of water from the Clinch River, called McCoy Branch, is included in the site; this area is where turtle traps are temporarily placed.

JULY- The site was surveyed for birds on 7/11/94, 7/12/94, and 7/18/94. The average high/low temperature was 78.5/70 °F Species observed include: Indigo bunting (*Passerina cyanea*), Field sparrow (*Spizella pusilla*), American crow (*Corvus brachyrhynchos*), Northern cardinal (*Cardinalis cardinalis*), Eastern meadow lark (*Sternella magna*), Rufus-sided towhee (*Pipilo erythrophthalmus*), Turkey vulture (*Cathartes aura*), **Black vulture** (*Coragyps atratus*), Barn swallow (*Hirundo rustica*), Eastern Bluebird (*Sialia sialis*), Chipping sparrow (*Spizella passerina*), Red winged blackbird (*Agelaius phoeniceus*), American gold finch (*Carduelis tristis*), Mourning dove (*Zenaida macroura*), Summer tanager (*Piranga rubra*), Red-bellied woodpecker (*Melanerpes carolinus*), and Carolina chickadee (*Parus carolinesis*).

On 7/1/94, two turtle traps were placed in a small inlet of water. The traps were open and baited from Monday to Thursday beginning with 7/13/94, trapping is still being conducted. Four Eastern painted turtles (*Chrysemys picta picta*), and Nine sliders (*Chrysemys scripta*) have been captured.

Boards were also placed around the vicinity of the water. No captures have been made, but a small mammal was observed under one of the boards.

Bear Creek Survey Summary
Site 19

Site 19 is a deciduous forest, standing 20 to 30 meters high, that surrounds Bear Creek Road. A drift fence with pitfall traps was constructed in this area along a small creek. Boards were also placed around the drift fence.

JUNE - Pitfall traps were opened in the mornings and closed in the evenings to capture small animals (mammals, reptiles, and amphibians). Traps were first opened on 6/23/94 and are still being used. No captures were made in June.

JULY - An Eastern box turtle (*Terrapene carolina carolina*) was found in a pitfall trap on 7/12/94.

Flashlight Heaven Survey Summary
Site 20

Site 20 is a cave just outside the fence line along highway 95. A deciduous forest standing 10 to 20 meters surrounds the area. The immediate site is a densely covered grassy area that contains poison ivy and periwinkle.

JULY- On 7/6/94 , five boards were placed around the cave to attract reptiles or amphibians possibly using the cave. Two slimy salamanders (*Plethodon glutinosus glutinosus*) were seen inside the cave. The boards were checked on 7/11/94 and on 7/20/94; no captures were made.

Beardon Creek Survey Summary
Site 21

Site 21 is a small inlet of water called Beardon Creek off the Clinch River. It is surrounded by a hardwood forest. Turtle traps were placed in the inlet on 7/25/94.

JULY- Five sliders (*Chrysemes scripta*), a Snapping turtle (*Chelydra serpentina*), and an Eastern painted turtle (*Chrysemes picta picta*) were captured.

AUGUST- Five sliders were captured.

Walker Branch Survey Summary
Site 23

The Walker Branch site is a hardwood forest with trees standing 20 to 30 meters. A small creek runs through the site.

AUGUST- Birding surveys were done on 8/8/94 and on 8/9/94. Species observed include: Northern cardinal (*Cardinalis cardinalis*), Northern bobwhite (*Colinus virginianus*), Pileated woodpecker (*Drycopus pileatus*), Louisiana woodthrush (*Seiurus motacilla*), Red-eyed vireo (*Vireo olivaceus*), Eastern Wild Turkey (*Meleagris gallopavo*), Yellow-billed cuckoo (*Coccyzus americanus*), and Tufted titmouse (*Parus bicolor*).

DISTRIBUTION

1. T. L. Ashwood
- 2 - 5. D. J. Awl
6. H. L. Boston
7. L. B. Cobb
8. J. S. Colley
9. K. W. Cook
10. R. B. Cook
11. L. T. Cusick
12. M. F. P. DeLozier
13. R. C. Durfee
14. J. W. Evans
- 15 - 18. C. A. Gabrielsen
19. R. L. Graham
20. J. T. Grumski
21. P. J. Halsey
22. E. L. Hannahs
23. R. K. Holmes
24. B. L. Kimmel
- 25 - 34. A. L. King
35. J. R. Lyons
- 36 - 37. D. M. Matteo
- 38 - 39. P. T. Owen
40. P. D. Parr
41. G. E. Rymer
42. R. K. White
43. Central Research Library
- 44 - 46. ER Document Management Center
47. ORNL Laboratory Records
48. C. S. Gist, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541
49. W. N. Lingle, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541
50. P. Phillips, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541
- 51 - 60. S. P. Riddle, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541
61. R. L. Sleeman, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541
62. N. Hendrix-Ward, DOE Oak Ridge Operations Office, P. O. Box 2001, Oak Ridge, TN 37831-8541