APPENDIX E:

LETTERS OF CONSULTATION AND BIOLOGICAL ASSESSMENT FOR BLUE GRASS ARMY DEPOT

ARGONNE NATIONAL LABORATORY
9700 SOUTH CASS AVENUE, BUILDING 900, ARGONNE, ILLINOIS 60439 TELEPHONE: 630/252-8849

June 22, 2000

Mr. Lee Barclay, Field Supervisor
Cookeville Field Office
U. S. Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

Dear Mr. Barclay:

The Department of Army, Assembled Chemical Weapons Assessment Program is preparing an environmental impact statement concerning its plans conduct pilot testing for the destruction of chemical agent and munitions stored at the Blue Grass Army Depot, located in Madison County, Kentucky about 3 mi southeast of the city of Richmond. The EIS will evaluate construction and operation of two different disposal technologies for destruction of chemical agent and munitions currently in storage at the depot. I've included a copy of the Federal Register Notice of Intent for the EIS.

We would appreciate receiving information on any federally-protected species that may be present at the Blue Grass site and in the site vicinity (within about a 30 mi radius of the site). Construction of the plant facilities, access rads, and other infrastructure upgrades would likely disturb about 40-50 acres. As part of the analysis of ecological impacts we will assess potential impacts to federally endangered, threatened, and candidate species. A list of these species and their residency status in the Blue Grass vicinity would be useful for the analysis.

Thank you in advance for your assistance.

Sincerely,

Edwin D. Pentecost

Edwin D. Pentecost, PhD
Environmental Assessment Division

Encl.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

July 25, 2000

Mr. Edwin D. Pentecost, Ph.D.
Argonne National Laboratory
9700 South Cass Avenue, Building 900
Argonne, Illinois 60439

Dear Dr. Pentecost:

Thank you for your letter and enclosure of June 22, 2000, regarding the preparation of an Environmental Impact Statement (EIS) for pilot testing of the destruction of chemical agents and munitions stored at the Blue Grass Army Depot in Madison County, Kentucky. U.S. Fish and Wildlife Service (Service) personnel have reviewed the information submitted and offer the following comments for consideration.

According to our records, the following federally listed endangered species occur on the Blue Grass Army Depot:

Running buffalo clover (*Trifolium stoloniferum*)
Indiana bat (*Myotis sodalis*)

According to our records, the following federally listed endangered species occur within a 30-mile radius of the Blue Grass Army Depot:

Running buffalo clover (*Trifolium stoloniferum*)
Indiana bat (*Myotis sodalis*)
Gray bat (*Myotis grisescens*)
Virginia big-eared bat (*Corynorhinus townsendii virginianus*)
Cumberland bean (*Villosa trabalis*)
Cumberland elktoe (*Alasmidonta atropurpurea*)
Little-wing pearly mussel (*Pegias fabula*)

Qualified biologists should assess potential impacts and determine if the proposed project may affect the species. We recommend that you submit a copy of your assessments and findings to this office for review and concurrence. A finding of "may affect" could require the initiation of formal consultation procedures.

These constitute the comments of the U.S. Department of the Interior in accordance with provisions of the Endangered Species Act (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.). We appreciate the opportunity to comment. Should you have any questions or need further assistance, please contact Steve Alexander of my staff at 931/528-6481, ext. 210, or via e-mail at *steven_alexander@fws.gov*.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

DEPARTMENT OF THE ARMY
PROGRAM MANAGER FOR ASSEMBLED CHEMICAL WEAPON ASSESSMENT
ABERDEEN PROVING GROUND, MD 21010-5423

REPLY TO ATTENTION OF

December 15, 2000

Assembled Chemical Weapons Assessment

Dr. Lee A. Barclay
U.S. Department of Interior
Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

Dear Dr. Barclay:

We have completed a Biological Assessment for the proposed Assembled Chemical Weapons pilot test project at Blue Grass Army Depot (BGAD) in Madison County, Kentucky pursuant to the Endangered Species Act requirements. The biological assessment was prepared based on your response to our letter requesting information on federally listed endangered species that occur on BGAD (see your response to Dr. Edwin D. Pentecost, Argonne National Laboratory dated July 25, 2000). Dr. Pentecost contacted Mr. Steven Alexander with questions on endangered species distribution in preparing the assessment. I am enclosing a copy of the biological assessment for your review and concurrence.

If you have questions on the biological assessment, don't hesitate to contact Dr. Pentecost (630) 252-8849 or me at (410) 436-2210.

Sincerely,

Jon Ware

Jon Ware

Enclosure

Copies Furnished:
E. Pentecost, ANL
J. Elliott, BGAD

United States Department of the Interior

FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, TN 38501

January 19, 2001

Mr. Jon Ware
Program Manager for Assembled Chemical
Weapon Assessment
Aberdeen Proving Ground, Maryland 21010-5423

Re: FWS #01-878

Dear Mr. Ware:

Thank you for your letter and enclosure of December 15, 2000, transmitting a biological assessment for the running buffalo clover relative to the proposed Assembled Chemical Weapons Pilot Test Project at the Blue Grass Army Depot in Madison County, Kentucky. Fish and Wildlife personnel have reviewed the document and we offer the following comments.

The biological assessment concludes that the proposed action is likely to adversely affect running buffalo clover. This determination requires initiation of formal consultation. However, the document states that construction impacts to running buffalo clover associated with the proposed action can not be accurately determined until decisions are made regarding facility structure and infrastructure locations. The document also indicates that protective measures would be implemented to avoid adverse effects to the species during construction of the facility, access roads, and utility lines.

If you wish to proceed with the proposed action based on the finding made in the biological assessment, we recommend that you submit a letter to this office requesting initiation of formal consultation. Your request should include the following:

1. A description of the action to be considered.

2. A description of the specific area that may be affected by the action.

3. A description of any listed species or critical habitat that may be affected by the action.

4. A description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effects.

5. Relevant reports, including any environmental impact statement or environmental assessment prepared.

6. Any other relevant available information on the action, the affected species, or critical habitat.

If you wish to re-evaluate the proposed action and its potential effects to the running buffalo clover pending final decisions on specific locations of the facility and associated roads and utility lines, please submit a supplement to the biological assessment with a determination of effect when those decisions have been made. We will review the supplement and provide a response at that time. This may be done concurrently with development of the environmental impact statement that is being prepared for this action.

Thank you for the opportunity to comment on this action. If you have any questions, please contact Jim Widlak of my staff at 931/528-6481, ext. 202.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

BIOLOGICAL ASSESSMENT FOR THE ASSEMBLED CHEMICAL WEAPONS ASSESSMENT PROGRAM AT BLUE GRASS ARMY DEPOT, RICHMOND, KENTUCKY

Submitted to

Dr. Lee A. Barclay
U.S. Department of Interior
Fish and Wildlife Service

by

John Ware
PM Assembled Chemical Weapons Assessment
Aberdeen Proving Ground, MD 21010-5424

December 2000

Biological Assessment for the Assembled Chemical Weapons Assessment Program at Blue Grass Army Depot, Richmond, Kentucky

Background

The Department of Defense (DOD) was directed by Congress as part of the Omnibus Consolidated Appropriations Act of 1997 (Public Law 104-208) to "demonstrate not less than two alternatives to the baseline incineration process for demilitarization of assembled chemical munitions". The DOD also was directed by Congress in this legislation to establish an Assembled Chemical Weapons Assessment (ACWA) Program. The Program Manager for ACWA announced the DOD's intent to prepare an Environmental Impact Statement (EIS) on plans to design, construct, and operate one or more pilot test facilities for assembled chemical weapon destruction technologies at one or more storage sites (Fed. Register, Vol. 65, No. 73, pp. 20139-20140, August 14, 2000). Potential locations for pilot testing include Anniston Army Depot in Alabama, Pine Bluff Arsenal in Arkansas, Pueblo Chemical Depot in Colorado and the Blue Grass Army Depot (BGAD) in Kentucky.

In fulfilling its responsibilities under the National Environmental Policy Act of 1969 and the Endangered Species Act of 1974, the DOD has prepared this biological assessment of potential impacts to federally-listed species from constructing and operating ACWA pilot test facilities at the BGAD. The BGAD is an active DOD installation in Madison County, Kentucky occupying 14,596 ac (5909 ha) located about 3.5 miles (5.6 km) south of Richmond. The installation facilities consist of 902 earth-covered igloos, 20 warehouses, 12 above ground magazines, 11 maintenance buildings, and 207 facilities used for administration, operations, medical care, and housing. BGAD allows deer hunting on designated areas of the installation during on specified dates during the deer hunting season. Livestock grazing is also permitted on designated tracts of land at BGAD throughout the year.

Project Description

The ACWA pilot test facilities would occupy an area of about 22 ac (8.9 ha) located adjacent to the Chemical Agent Storage Area in the north-central portion of BGAD (see Figure 1). Two alternative locations for the test facilities are being evaluated in the EIS; one is located along the southeast perimeter of the storage area (Area A) and a second is located along the western perimeter of the storage area (Area B). Each area encompasses about 110 ac (44.5 ha). The ACWA technologies being evaluated are intended to provide DOD with valuable information in deciding on the technology to be selected for disposal of nerve agent and mustard gas currently contained in munitions stored in igloos at the BGAD. The two treatment technologies that would be tested are neutralization followed by super critical water oxidation and neutralization followed by biological treatment. In order to dispose of all nerve and mustard gas at BGAD the ACWA facilities are assumed to operate for about 36 months as a bounding case for the EIS analysis. The following paragraphs provide a brief overview of the treatment technologies.

Neutralization-Super Critical Water Oxidation
After disassembling the munitions to access the agent and energetics (explosives and propellants) this technology would neutralice the chemical agents and energetics with water and caustic chemicals. The products of the neutralization would then be destroyed using the Supercritical Water Oxidation (SCWO) process. SCWO mineralizes the resulting chemicals at temperatures and pressures above the critical point of water (705.2 F. and 3,204.6 psia). Effluents could be held and tested before release through pollution processes. Process water would be reused and solid residues would be disposed of in a hazardous waste landfill.

Neutralization-Biotreatment
After disassembling the munitions to access the agent and energetics this technology would neutralize the chemical agents with water and caustic chemical. The products of neutralization would then be destroyed in a biological treatment process operated at temperature and pressures near ambient conditions. Organic vapors and odors would be passed through an air pollution control process. Recovered metal parts and dunnage would be treated at high temperatures and effluents would be held and tested before release through the pollution control processes. Process water would be reused and solid residues would be disposed on in a landfill.

No liquid wastes produced by the two treatment processes will be released to the environment. Any process-generated liquids will be disposed of properly in containers suitable for disposal in an offsite licensed disposal facility. During pilot testing of the two technologies minor amounts of trace metals (i. e., $< 10^{-8}$ lbs./yr.) and organic compounds will be emitted to the atmosphere. Monitoring of emissions would likely be required under the RCRA permit that would be required for operation of the ACWA facilities. Operation of the facilities will require laundry facilities for workers and construction of a sanitary waste treatment facility.

In addition to land required for the ACWA pilot test facilities about 48 ac (19.4 ha) could be disturbed during construction of the site infrastructure. These areas of disturbance include a new north-south access road connecting the BGAD boundary with the ACWA facilities, road widening, parking lots, vehicle and parts storage buildings, a sedimentation pond to control construction runoff, two electrical substations, rights-of-ways for gas, water, electrical power lines, a sanitary sewer line, and buried communication lines.

Affected Environment

The BGAD is located in the Outer Bluegrass Subsection of the Low Plateaus Province in east central Kentucky. As a result of grazing much of the installation is fescue-dominated grassland with isolated stands of black cherry (*Prunus serotina*), black locust (*Robinia pseudoacacia*) and brambles (*Rubus, spp.*). Other portions of the installation where grazing no longer occurs have been planted in oaks and other hardwood tree species to create larger, contiguous blocks of forest habitat (BGAD 2000a). Forests on well-drained upland areas of BGAD include bluegrass mesophytic cane forest, bluegrass savanna-woodland, calcareous subxeric forest and calcareous mesophytic forest (BGAD 2000a). Canopy dominants vary based on soil moisture, aspect, and past disturbance. Common canopy trees include black walnut (*Juglans nigra*), Ohio buckeye (*Aesculus glabra*), bur oak (*Quercus macrocarpa*), chinkapin oak (*Q. muhlenbergii*), shumard oak (*Q. shumardii*), white oak (*Q. alba*) pignut hickory (*Carya glabra*), shagbark hickory (*C.*

ovata), honey locust (*Gleditsia triacanthos*), sugar maple (*Acer saccharum*), and white ash (*Fraxinus americana*). Understory species have been severely impacted by cattle grazing.

Areas A and B support different plant communities. Area A is an ungrazed grassland plant community with a few scattered American sycamore (*Platanus occidentalis*) trees in the eastern portion. Immediately northeast of Area A is a bluegrass mesophytic cane forest. Area B is comprised of a stand of mixed hardwood trees on a relatively level area immediately west of the Chemical Agent Storage Area. An intermittent stream traverses the western portion of the area. Area B is within a livestock-grazing tract that encompasses most of the western portion of BGAD.

Endangered Species at Blue Grass Army Depot

The only federally-listed endangered species documented from surveys at BGAD is the running buffalo clover (*Trifolium stoloniferum*). Mist net surveys for bats inhabiting or visiting BGAD have failed to detect the endangered Indiana bat (*Myotis sodalis*). Six mist net surveys conducted along Muddy Creek located south and east of the project area during the summer of 1993 recorded four bat species (Bloom, et al., 1995). Although the Indiana bat is thought to occur at BGAD and in the general vicinity (letter dated July 25, 2000 from Lee Barclay, U.S. Fish and Wildlife Service to Edwin Pentecost, Argonne National Laboratory) surveys have yet to document its presence on the installation. Based on discussions with natural resources staff at BGAD during an ACWA site visit in June 2000, there are no documented records of the Indiana bat on the installation. Since 1993 ongoing surveys by the Kentucky Nature Preserves Commission, Kentucky Nature Conservancy, and Eastern Kentucky University researchers have not detected the Indiana bat. Therefore, this biological assessment addresses only running buffalo clover.

The RBC was listed as endangered, effective July 6, 1987 by the U.S. Fish and Wildlife Service (Fed. Register, Vol. 52, No. 108, pg. 21478, June 5, 1987). Historically RBC was documented as occurring in Kansas, Missouri, Arkansas, Illinois, Indiana, Ohio, Kentucky, and West Virginia. At the time of listing the only confirmed populations were from two locations in West Virginia. After field observations at documented locations in these states, Brooks (1983) concluded that *T. stoloniferum* was possibly extinct. Bloom, et al., (1995) reported that the Kentucky Nature Preserves Commission had documentation in 1994 of *T. stoloniferum* occurring in nine Kentucky counties all within the Bluegrass Region. Twenty-five populations were known at Kentucky locations in addition to populations on the BGAD. Bloom, et al., (1995) also reported that experts from Ohio, Indiana and West Virginia confirmed the existence of multiple populations in those states since 1987. The increase in known populations since July 1987 may be a function of more extensive surveys by qualified botanists rather than an increase in the population within the RBC's geographic range. Recent observations at BGAD have also discovered new populations since the surveys in 1993 and 1994 (BGAD 2000b).

Current Status of Running Buffalo Clover at Blue Grass Army Depot

Bloom, et al., (1995) reported that surveys conducted in 1993 and 1994 at BGAD yielded 145 patches of RBC. A patch was defined as "one or more clustered running buffalo clover plants at

least 7.5 m from any other Running Buffalo Clover plants". Patch sizes ranged from one plant in an area of approximately one square foot (0.09 sq m) to hundreds of plants covering over 1200 square feet (>108 sq m). Most patches contained less than 20 plants and covered less than 100 square feet (<9 sq m). The known locations of RBC at BGAD are shown in Figure 1. In May 1999 a collaborative effort by BGAD, Eastern Kentucky University, the Kentucky Office of The Nature Conservancy, and the Kentucky Nature Preserves Commission was made to evaluate a random sample from the 145 patches located in 1994. The study was intended to document site condition and compare data with previously collected information (BGAD 2000b). Study results indicated a decline or loss of 8 of the 30 patches examined that were surveyed and described in 1994, and a change in RBC patch condition based on dense cover from competing vegetation. Healthier populations were found along deer trails and areas of stream scouring. Flowering in some patches, however, was more prolific in 1999 than in 1994. Detailed plans for protection and continued monitoring of RBC on BGAD are described in the Endangered Species Management Plan and Environmental Assessment (BGAD 2000b). Protection measures and planned management goals are discussed later in the biological assessment.

Species Description and Biology

The following description of RBC is taken mostly from Bloom, et al., (1995) and BGAD (2000b): Running buffalo clover (*Trifolium stoloniferum*) is a glabrous, stolon forming perennial species of the Pea family (Fabaceae). It possesses trifoliate leaves that grow from a central rooted crown (referred to as the mother plant) and at nodes along the stolons. The leaves are often typically short making the plant difficult to detect. Plants vary in height from 3-20 inches (7.6 – 50.8 cm) above the soil surface. Some leafy nodes become rooted during the growing season both early in the season and in late summer when the stoloniferous nodes and mother plant senesce. The mother plant typically produces 1-2 flower heads in May and June at BGAD. Fruit forms in July. Flowers are typically white with purple streaking and about 1 inch wide. Each flower stem has a pair of opposite leaves below the flower head. Stipules are green and leafy. RBC differs from white clover (*T. repens*) by having leafier stipules and the pair of leaves on the flower stalk. It also differs from two other clover species, red clover (*T. pratense*) by the flower color and lack of pubescence, and from alsike clover (*T. hybridum*) by its stoloniferous habit.

RBC grows on mesic, well-drained soils with a somewhat open canopy cover having light intensity of about 40-60% full sunlight (Bloom, et al., 1995). It is a perennial species that occurs in savannas, open woodlands, along floodplains, and mesic terraces (BGAD 2000b). Plants seem to thrive in areas where moderate disturbance has reduced competition from other herbaceous and shrub vegetation. Sources of disturbance include livestock grazing, light trampling of floodplain areas, stream scouring, and mowing. Also, the exotic species, scorpion grass (*Microstegium vimineum*) occurs in dense stands in the herbaceous layer of open canopy floodplain areas where many RBC stands have been documented (Bloom, et al., 1995). Scorpion grass was reported at all but 17 of the 145 patches where RBC was found. In many areas where RBC was found during the 1993 and 1994 surveys, scorpion grass represented 75-100% of the herbaceous ground cover. Such dense stands are likely to be unfavorable for the continued survival of RBC, competing for light and nutrients in specific patches. Bloom, et al., (1995) reports that some success has occurred on BGAD where experimental applications of the

monocot-specific herbicide POAST™ was used on dense scorpion grass patches prior to seed production in September. RBC plants survived the application of herbicide while scorpion grass was completely eliminated. Bloom, et al., (1995) suggest that a multi-year application of herbicides may be necessary to eliminate scorpion grass from RBC patches to assure its continued survival at BGAD. Such applications may be required since scorpion grass seeds can remain viable in the soil for several years.

Impacts of ACWA Pilot Test Facilities on Running Buffalo Clover

Construction of the ACWA Pilot Test Facilities will disturb about 22 ac (8.9 ha) at the site selected. Neither Area A nor B is in locations where RBC has been detected during field surveys (see Figure 1). Although surveys have not detected RBC patches at Areas A or B, adjacent areas support open canopy floodplain forest that is considered suitable habitat. Potential RBC habitat along intermittent streams and floodplain forest at BGAD in the vicinity of the candidate ACWA sites is shown in Figure 2. Potential impacts to RBC could occur from construction of a new access road to Area B, a 69 kV electric transmission line, and from new gas, water, and sanitary sewer pipelines needed to support the ACWA site. These rights-of-ways will be subject to surface disturbance during infrastructure construction that may traverse extant patches of RBC along the Muddy Creek and tributaries located south and east of Areas A and B.

Surface disturbance for gas and water lines is expected to occur along previously disturbed road rights-of-ways. Gas and water pipelines are estimated to disturb a right-of-way up to 60 ft (18.3 m) in width. The 69 kV power line will require a 40-foot (12.2 m) wide right-of-way to meet National Electrical Safety Code requirements (Institute of Electrical and Electronics Engineers, Inc., 1987). Approximately 20 and 29 wooden poles with an average 320-ft (97.6 m) spacing would be needed to supply power to Areas A and B respectively. The power line would extend from an existing power line traversing the northern portion the BGAD, south to onsite highway Route 2 and then turn west to the ACWA site. A maximum area of approximately 900 ft^2 (83.6 m^2) would be disturbed at each wooden pole and conductor stringing location during construction. The locations of other areas disturbed during construction cannot be identified at this time. Locations of the following areas will be identified in the final engineering design: the sanitary waste treatment facility, electrical substation, parking lots, a construction sedimentation pond, and routes for buried communication cables. For purposes of this biological assessment however, probable locations were assumed to allow an evaluation of construction activities on known location of RBC populations.

Conservation Measures (Protective Measures to Minimize Effects of ACWA Project)
The BGAD has several goals and plans in place to protect and manage both existing patches of RBC and potential habitat. Potential habitat consists of about 1,000 ac (404.9 ha) along floodplains adjacent to perennial streams. In addition, BGAD intends to follow measures and goals being developed in the Draft Recovery Plan for RBC currently being prepared by the U.S. Fish and Wildlife Service. Specific goals, objectives and actions implemented at BGAD (BGAD 2000b) to protect RBC patches include:

- Develop the BGAD Endangered Species Management Plan (ESMP) with input and interaction from the U.S. Fish and Wildlife Service, Kentucky Nature Preserve Commission, and the Kentucky Office of The Nature Conservancy. Once the ESMP is finalized it will be

incorporated into the BGAD's Integrated Natural Resources Management Plan. A Draft Final ESMP was prepared in June 2000 (BGAD 2000b)

- Conduct an installation-wide survey of RBC beginning in Spring 2000. The objective of the survey is to establish a baseline for evaluating future RBC populations, goals, and management needs for monitoring management success and tracking of future population trends
- Assess the current status of RBC populations on BGAD using the Spring 2000 survey data. New patches will be marked with a sign designating presence of a threatened or endangered species at a specific location
- Develop and initiate intermediate actions to maintain and enhance RBC populations and suitable habitat at BGAD. These actions will be developed with input from the U.S. Fish and Wildlife Service
- Establish study areas encompassing RBC patches. Specific intermediate management actions will be implemented at certain locations. Establishment of the study areas will enable BGAD land management personnel to monitor effectiveness of intermediate management actions
- Conduct annual RBC population counts during the first five years the ESMP is in force using the same data collection and analysis techniques used during the Spring 2000 survey. Results will allow land managers to alter or cancel management activities based on population trends
- In consultation with the U.S. Fish and Wildlife Service, BGAD will develop RBC population goals that are compatible with the military mission. The goals will rely on the Spring 2000 survey results and the Draft RBC Recovery Plan.

If the U.S. Army decides to build an ACWA pilot test facility at BGAD a project specific mitigation plan will be developed for RBC. The following measures will be taken to further protect RBC patches and habitat once draft facility and infrastructure designs are developed and tentative decisions are made on placement of structures and infrastructure requirements.

- Attempt to locate facilities away from existing and potential RBC habitat
- Evaluate how utility corridors and roadways can be moved to avoid or span known RBC patches and potential habitat
- Determine the location and precise locations for fabrication and laydown areas needed for construction of the 22 ac (8.9 ha) ACWA site and support facilities
- Conduct clearance surveys for RBC in areas likely to be impacted by construction
- Instruct construction managers on what types of habitat to avoid and whom to notify if questions arise about possible impact to RBC patches during the construction process
- Have a qualified botanist on site during construction to assure RBC patches are avoided to the extent possible

Conclusions (Effects Determination)

Construction impacts on RBC associated with the ACWA pilot test facility and infrastructure cannot be accurately determined until decisions are made on facility structure and infrastructure locations. Potential habitat and known locations are shown in Figures 1 and 2. The distribution

of RBC on the northern portion of BGAD is also shown on a topographic map of the project area (see Figure 3). Figure 4 shows potential locations for access roads, the 69 kV electrical power line, water lines, gas lines, and fiber optic cable communication lines that would be needed for construction at either Area A or B. By superimposing locations of RBC patches identified in surveys conducted in 1993 - 1994 over the infrastructure and site facility locations, potential areas of impact can be identified. Some flexibility to avoid potential offsite impacts to RBC is possible in locating the ACWA facilities in Areas A and B since about 22 ac (8.9 ha) of the 100 ac (40.5 ha) in each area will be required. A project decision on locations of new access roads or existing BGAG roads (depicted as Option 1 or 2 in Figure 4) could potentially impact previously identified patches of RBC southwest of Area B. Eight separate patches were recorded in close proximity [(i.e., locations less than 100 ft (30.5 m)] to existing roadways within this area. Construction of the communication cable along the road right-of-way under Option 1 could have both negative and positive impacts to existing RBC populations. New habitat could be created by removal of the herbaceous or shrub ground cover along the right-of-way by stringing the fiber optic cable, which could enhance invasion of disturbed areas by RBC following cable installation. To the extent that known populations could not be avoided, direct loss of individual plants or patches would occur. Some loss of RBC plants or potential habitat could result from sediment buildup along rights-of-ways during construction activities, if runoff from disturbed sites occurs.

Construction of the 69 kV power line to Area A would traverse floodplain habitat near known RBC locations along tributaries of the Muddy Creek to the northeast (see Figure 4). Impacts can be minimized or avoided if tower spacing is adjusted to avoid known RBC patches. Clearance surveys prior to decision making on tower and conductor stringing locations would further reduce potential construction impacts.

Construction at the ACWA site would disturb about 22 ac (8.9 ha). A 1.4 ac (0.6 ha) sedimentation pond would be installed to control runoff from construction areas, and avoid sediment buildup in intermittent streams.

Operation of the ACWA facilities is not expected to impact the RBC. Trace elements released to the atmosphere by the destruction methodologies being tested for chemical agent destruction would be $<10^{-8}$ lbs./yr. and be dispersed over a relatively large geographic area. Process water is either recycled or disposed of in a manner to meet existing regulations. No chemical agent (i.e., mustard gas or nerve gas) or degradation products would be released during normal facility operations. Sanitary effluent from the wastewater treatment facility would meet National Pollutant Discharge Elimination System standards set for the facility by the State of Kentucky.

It is concluded that the construction of ACWA facilities and associated infrastructure “may affect and is likely to adversely affect” some individual patches of RBC. This conclusion is based on the proximity of project activities to known patches documented during the 1993 and 1994 surveys. Once BGAD personnel receive the results of spring surveys conducted in 2000, more current information will be available on patch distributions. This new information will be made available to the U.S. Fish and Wildlife Service once reviewed by the BGAD environmental staff.

Literature Cited

BGAD. 2000a. Integrated Natural Resources Management Plan and Environmental Assessment, Blue Grass Army Depot, Richmond, Kentucky. Prepared by Gulf Engineers and Consultants, Prepared for U.S. Army Corps of Engineers, Louisville District, Louisville, KY. 128 pp.

BGAD 2000b. Endangered Species Management Plan and Environmental Assessment, Blue Grass Army Depot, Richmond, Kentucky. Prepared by Gulf Engineers and Consultants, Prepared for U.S. Army Corps of Engineers, Louisville District, Louisville, KY. 25 pp. + appendices.

Bloom, T., Cicerello, R. R., and B. Palmer-Ball, Jr. 1995. Rare Species and Aquatic Faunal Survey of Bluegrass Army Depot, Kentucky, Prepared by Kentucky State Nature Preserves Commission, Prepared for Bluegrass Army Depot, Richmond, Kentucky.

Brooks, R. E. 1983. *Trifolium stoloniferum*, Running Buffalo Clover: Description, Distribution and Current Status. Rhodora 85: 343-354.

Institute of Electrical and Electronics Engineers, Inc. 1987. Tables from the National Electrical Safety Code, An American National Standard. The Institute of Electrical and Electronics Engineers, Inc., New York, NY, 64 pp.

Contacts Made

Lee Barclay	U.S. Fish and Wildlife Service
Steven Carpenter	U.S. Fish and Wildlife Service
Mary Murray	Blue Grass Army Depot
Joseph Elliott	Blue Grass Army Depot

Preparer

Edwin D. Pentecost	Argonne National Laboratory

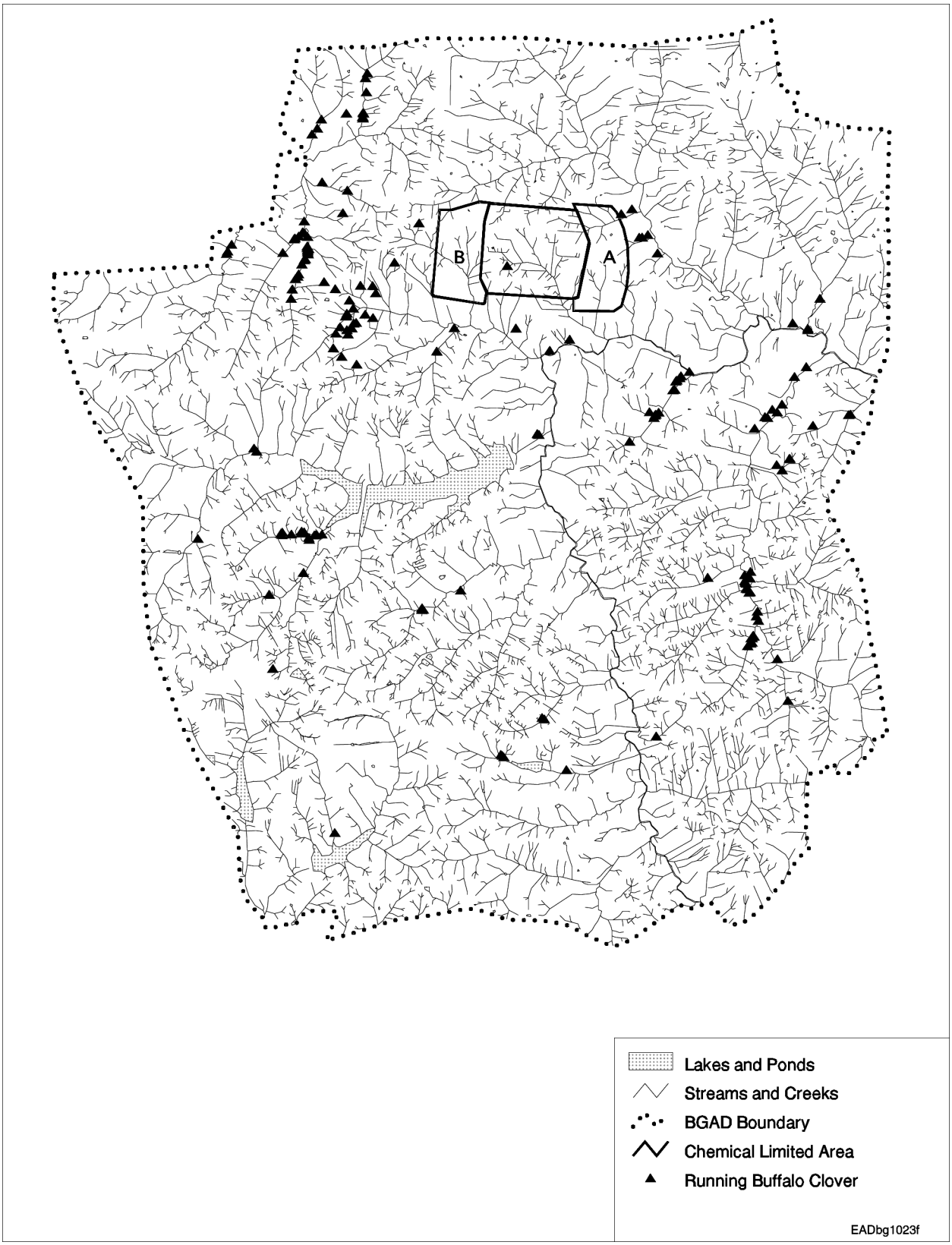

FIGURE 1 Blue Grass Army Depot Showing Chemical Storage Area and Possible Locations (A&B) for ACWA Pilot Test Facilities

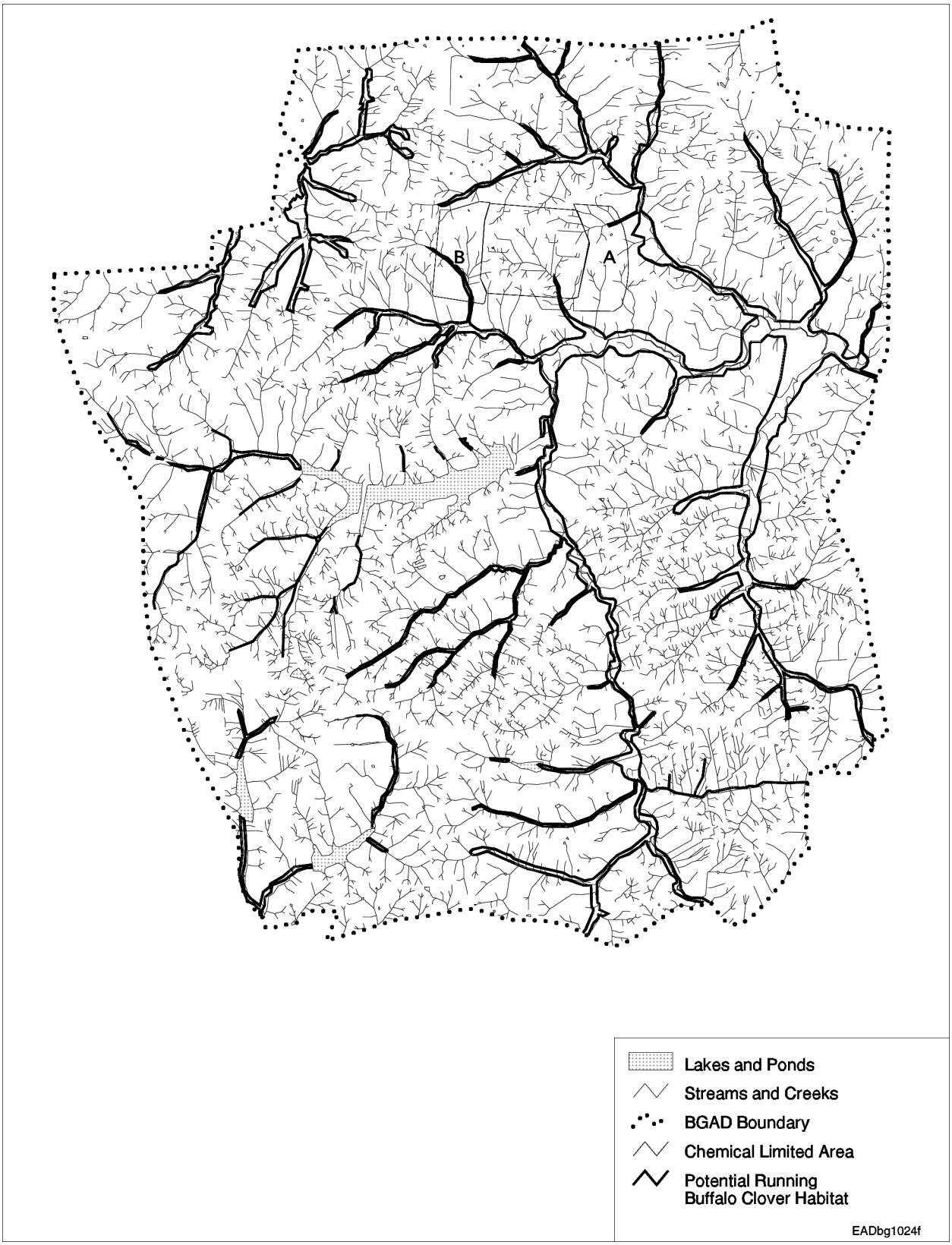

FIGURE 2 Potential Habitat for Running Buffalo Clover (Trifolium Stoloniferum) at Blue Grass Army Depot

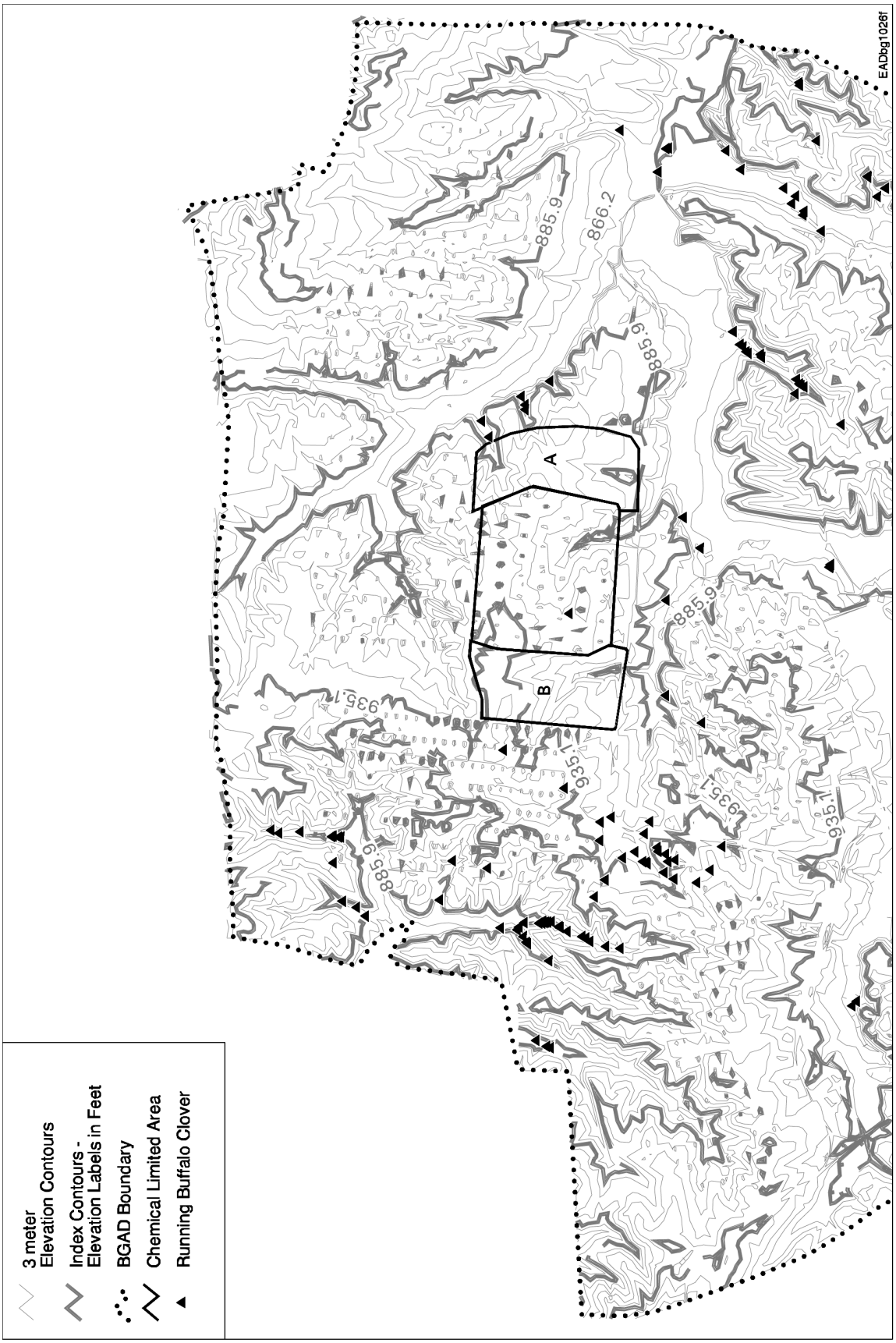

FIGURE 3 Elevational Contours at Blue Grass Army Depot in the Vicinity of Alternative ACWA Sites (Areas A & B)

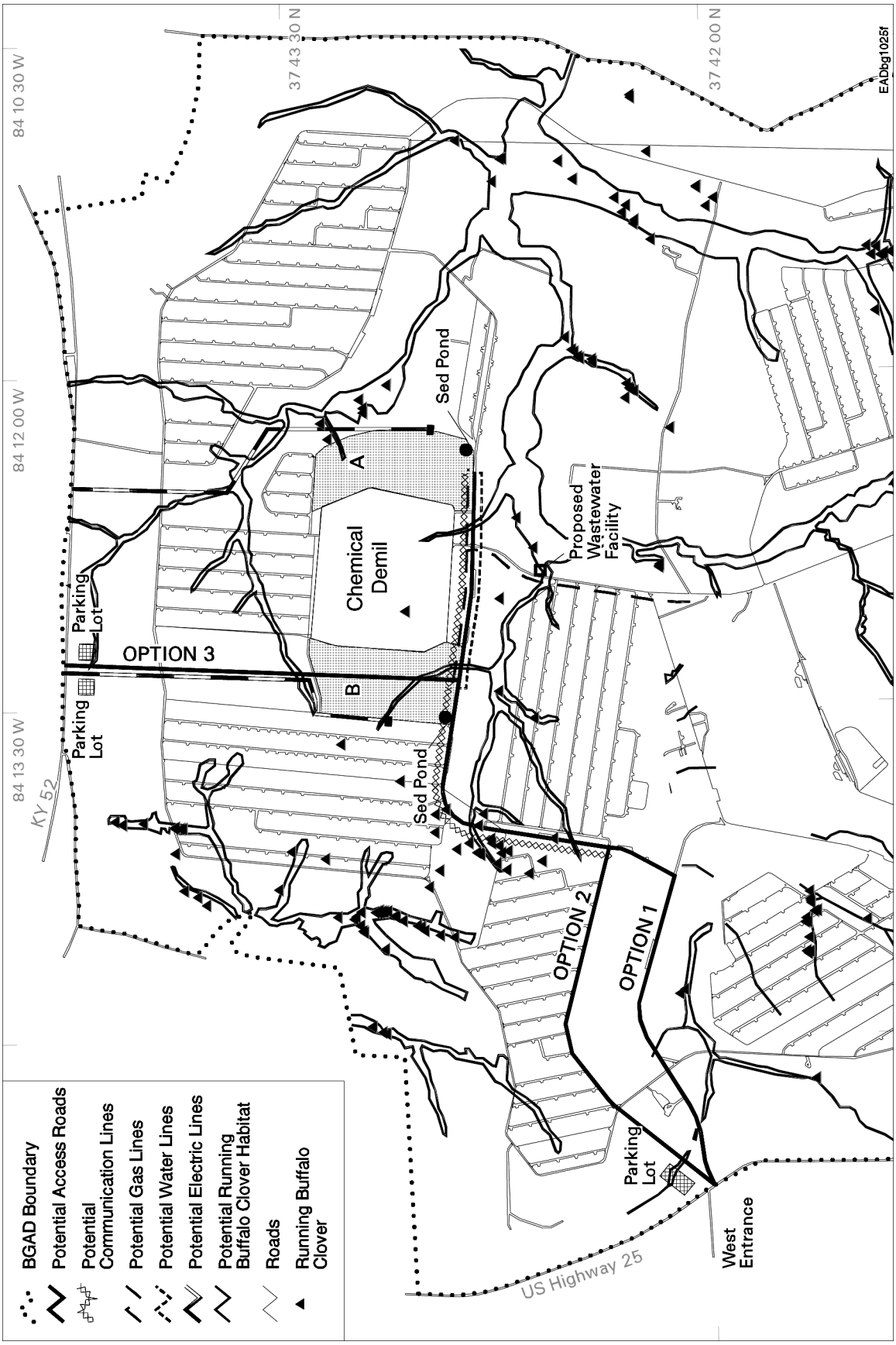

FIGURE 4 Potential Areas of Disturbance for Construction of ACWA Pilot Test Facilities at Blue Grass Army Depot