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Reconnaissance Survey of Previously Delineated Wetlands and Additional Areas on the East Bear Creek Valley Site for the Proposed On-Site Waste Management Facility

Barbara A. Rosensteel

Environmental Sciences Division
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Barbara A. Rosensteel
Wetlands & Watersheds, Consulting

Environmental Sciences Division
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Prepared for
C. W. Hutzler
Bechtel Jacobs LLC

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6285
managed by
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ABBREVIATIONS

BC	Bear Creek
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
NT	northern tributary
OBL	obligate wetland
ORR	Oak Ridge Reservation
PEM1	palustrine emergent wetland, persistent
PFO1	palustrine forested broad-leaved deciduous wetland
PSS1	palustrine scrub-shrub wetland
ROW	right-of-way
TDEC	Tennessee Department of Environment and Conservation
UPL	upland
USACE	U.S. Army Corps of Engineers

1. INTRODUCTION

The U.S. Department of Energy proposes to construct an on-site waste management facility on the Oak Ridge Reservation (ORR). East Bear Creek's Valley is the preferred location for the facility. The proposed site (Figure 1) is located immediately north of Bear Creek Road and west of the Oak Ridge Y-12 Plant, in administrative grid locations D10, D11, E10, and E11 of U.S. Geological Survey Map S-16A. On March 20, May 19, and May 22, 1998, field surveys were conducted to verify the wetland areas in the drainages of Bear Creek northern tributaries, NT-1, NT-2, NT-3, NT-4, NT-5, and NT-6. The boundaries of some of the wetlands in these drainages had been delineated and located by civil survey in 1992. Therefore, the mapped boundaries are accurate. Precise boundary determinations and civil surveys have not been completed for the remaining wetlands; thus, the boundary lines and areas of these wetlands are estimated.

The objective of the survey was to ascertain whether the current wetland boundaries and wetland types in these areas were substantially similar to those previously delineated in 1992. The March 20 survey area included:

- The entire lengths of NT-3, NT-4, NT-5, and NT-6 upstream of Haul Road;
- A portion of the NT-2 drainage; and
- Limited areas of NT-3, NT-4, NT-5, and NT-6 downstream of Haul Road.

On May 19 and 22, 1998, additional field surveys were conducted on areas adjacent to the original survey area. The survey areas were

- NT-1 from the source to Bear Creek Road;
- Portions of NT-2 not surveyed in the earlier work, from the source to Haul Road; and
- NT-6 downstream of Haul Road.

The survey also included a verification of the location and size of wetlands identified during the March 20 survey in the downstream section of NT-5 (NT5-3 and NT5-4) and in a seep channel area (BC-0). With the exception of one wetland that was observed from Haul Road outside of the fence, NT-3 downstream of Haul Road is excluded from the May 1998 survey area because it is outside of the proposed project boundary.

The wetlands were identified according to the three-parameter approach described in the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (USACE 1987). No data describing wetland characteristics were gathered during this survey except for those wetland areas that were not previously delineated and described. Documentation to support the earlier wetland findings can be found in Rosensteel and Trettin (1993).

The indicator classification system used to determine if a vegetation community is hydrophytic is detailed in Reed (1988). In this system, plant species are assigned to a specific indicator class based on the probability of occurrence in a wetland. The classifications are obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland

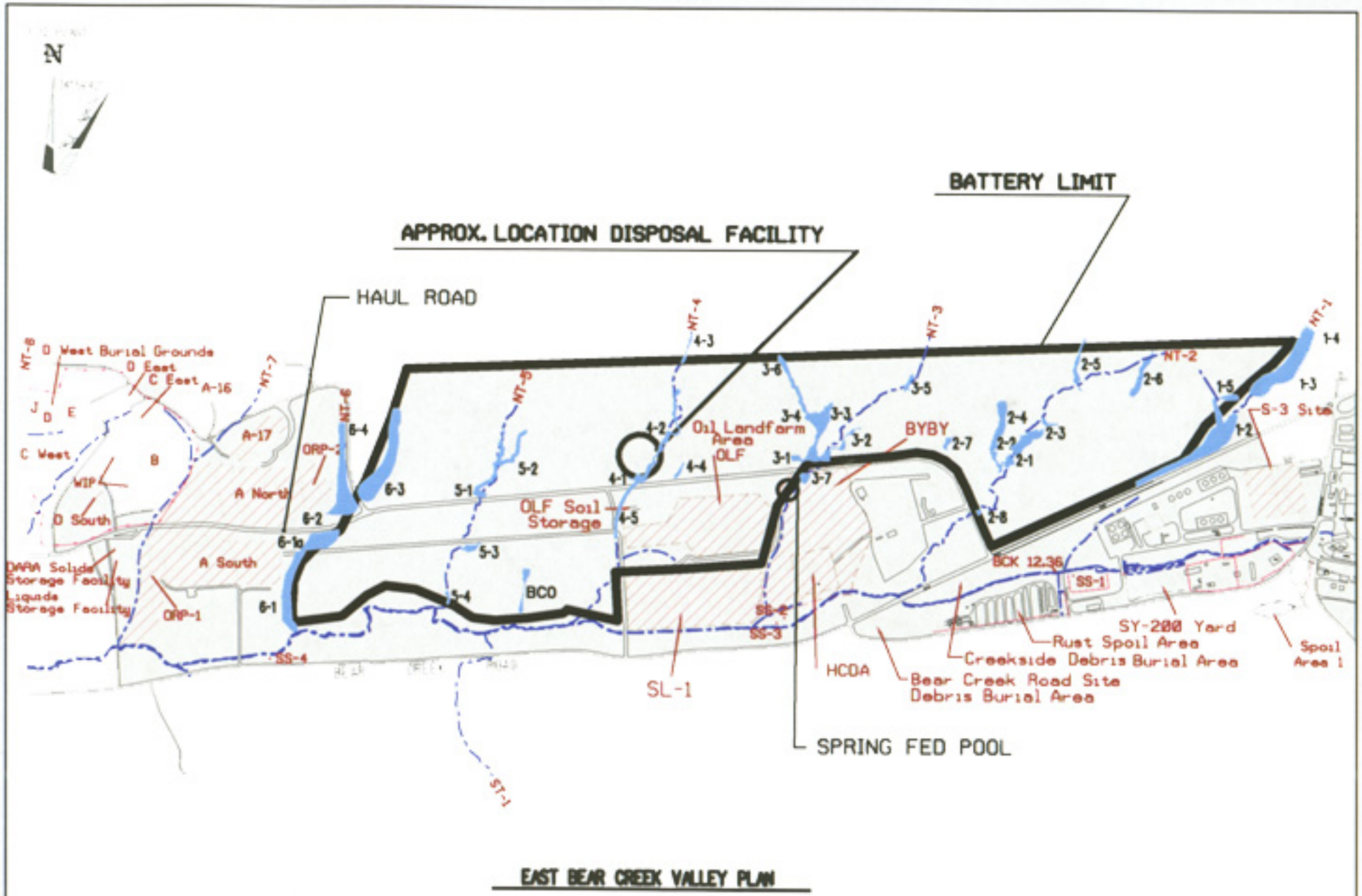

Figure 1. Survey of wetlands (light blue areas) on the proposed site.

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EAST BEAR CREEK VALLEY SITE
WETLANDS SURVEY
DOE - Oak Ridge Reservation - Oak Ridge, Tennessee

SCALE IN FEET

(FACU), and upland (UPL). A plus (+) or minus (−) sign following the classification indicates a tendency toward the wetter or drier end of the range, respectively. Munsell soil color charts (Kollmorgen Instrument Corporation 1992) were used to identify the soil matrix and mottle colors as part of the determination of hydric soils.

2. FIELD FINDINGS

The boundaries of the wetlands in all of the drainages are substantially the same as when they were first identified in 1992. Five additional wetlands were identified—a pond/emergent wetland in the NT-1 drainage; two forested wetlands in the NT-5 drainage; a forested wetland in the NT-6 drainage; and a forested wetland along a previously unidentified seep channel referred to herein as BC-0.

Usually if a wetland delineation is more than 5 years old, the Tennessee Department of Environment and Conservation (TDEC) and the USACE require that a new delineation be performed. However, because the delineated wetland areas have been found to be the same as in 1992, it is possible that TDEC and USACE, upon request and their review of the data, might accept the 1992 mapping of these wetlands without requiring a new delineation. It is likely, however, that the additional wetland areas identified during this survey, and the previously identified wetlands that do not have accurate boundary determinations, will require a boundary delineation if activities are proposed in or adjacent to them.

The wetlands are shown on Figure 1. A brief description of the wetlands in each of the stream drainages follows.

2.1 TRIBUTARY NT-1

The boundaries of NT1-3 and NT1-4 have been delineated and located by civil survey. The boundaries of NT1-2 and NT1-5 are estimated. NT1-2 was previously identified. NT1-5 was identified during this survey.

NT1-2: Palustrine forested wetland (PFO1) in the bottomland of NT-1 between Bear Creek Road and the transmission line right-of-way (ROW).

NT1-3: This area contains a small pond and a palustrine scrub-shrub wetland (PSS1). It is located upstream of, and partially in, the transmission line ROW.

NT1-4: PFO1 wetland that extends from the PSS1 wetland (NT1-3) to the spring at the head of NT-1.

NT1-5: During the 1992 survey, a small man-made pond was found in the transmission line ROW. It was not mapped at that time because there was not significant wetland development around the pond. Since 1992, a palustrine emergent wetland (PEM1) has developed on the pond margins.

The pond drains to the NT1-2 wetland downstream of the ROW through a tributary stream.

The vegetation community is hydrophytic. The dominant species include rushes (*Juncus biflorus*, OBL; *Juncus acuminatus*, FACW; and *Juncus effusus*, FACW; spikerush (*Eleocharis* sp., OBL), woolgrass (*Scirpus cyperinus*, OBL), and cutgrass (*Leersia* sp., OBL). Loblolly pine (*Pinus taeda*, FAC) is growing at the northeast end of the wetland. The soil has been disturbed in the past for ROW construction. The surface layer is a very gravelly and shaly silt with a 2 chroma matrix and oxidized rhizospheres. This is underlain at a few inches by a red (10YR 5/6), non-hydric clay loam with light gray (10YR 7/1) streaks. The soil was saturated, and there was ponded water over most of the wetland area.

2.2 TRIBUTARY NT-2

The boundaries of all but one (NT2-8) of the wetlands in the NT-2 drainage were delineated and located by civil survey in 1992. The boundaries and characteristics of the wetlands in this drainage are substantially the same as they were in 1992. The wetlands in the ROW are PEM1 or palustrine scrub-shrub (PSS1). The wetlands upstream and downstream of the ROW are PFO1 wetlands or PEM1 wetlands on alluvial shelves within the banks or in low spring and seep areas next to the stream channel.

NT2-1: PFO1 wetland in the riparian zones of NT-2 and a small subtributary. This area includes PEM1 wetlands within the stream banks.

NT2-2: This area includes two wetland areas in the transmission line ROW. They are a PEM1 wetland and a PSS1 wetland in the riparian zones of NT-2 and a tributary of NT-2.

NT2-3: PFO1 wetland in a subtributary bottomland.

NT2-4: PFO1 wetland in the NT-2 bottomland. This also includes areas of emergent wetland on alluvial shelves within the banks and at small spring/seep areas.

NT2-5 and 2-6: These are both PFO1 wetlands in wide, level riparian zones of subtributaries.

NT2-7: A PSS1 wetland formed in an open area adjacent to the 90-degree bend in Haul Road. The wetland is on the upstream side of Haul Road along an NT-2 subtributary. This subtributary continues through a cleared, grassy area on the downstream side of Haul Road before emptying into NT-2. This downstream area of NT-2 is outside of the survey area.

NT2-8: A PEM1 wetland in an open area on the upstream side of Haul Road culvert. The boundary is estimated.

2.3 TRIBUTARY NT-3

Only the NT-3 portion of the drainage upstream of Haul Road is within the survey area. However, one wetland on the downstream side of Haul Road is included because it was identified in a previous survey and was observed from Haul Road during this survey. All of the wetlands except NT3-6 and NT3-7 were located by civil survey in 1992. NT3-6 was identified during the current survey. The boundaries and characteristics are substantially the same as they were in the 1992 delineation.

NT3-1: Forested/emergent (PF01/PEM1) wetland on the upstream side of the Haul Road bank. This is a semipermanently flooded area as a result of the detention of water by the road bank and culvert.

NT3-2: Small areas of PEM1 wetland on alluvial shelves within steep-sided stream banks and at seeps at breaks in the stream bank.

NT3-3: PFO1 wetland in a wide seep area at the head of the middle branch of NT-3. This seep wetland is an unusual type on the Oak Ridge Reservation (ORR) because of its size in a headwater location and its perennial saturation.

NT3-4: This wetland is similar to NT3-2, with the addition of a small PSS1 seep area wetland at the head of the stream.

NT3-5: PEM1 wetland in the narrow riparian zone along the upper reach of the stream.

NT3-6: This wetland area was identified during the current survey and has not been delineated. The boundary is estimated. The vegetation includes sweetgum (*Liquidambar styriciflua*, FAC), tulip poplar (*Liriodendron tulipifera*, FACU), and ironwood (*Carpinus caroliniana*, FAC) in the canopy and sapling layers. In the groundcover layer, the species included Japanese honeysuckle (*Lonicera japonica*, FAC–), microstegium (*Eulalia viminea*, FAC+), lady's fern (*Athyrium filix-femina*, FAC), and an unidentified sedge. In the absence of other indicators, this vegetation community is not clearly indicative of wetlands. However, as the growing season progresses, additional species might be found in the ground-cover layer.

The soil is a gray (10YR 5/1) silt loam to a depth of 6 inches and a gray (10YR 6/1) silt loam with mottles and manganese concretions (5YR 4/6) at a depth of 6 to 12 inches. There was water on the surface in places. The soil was saturated, and there was free water in the soil borings at or within 3 inches of the surface. This area may be saturated for different lengths of time after storm events in the spring and summer but may not be saturated in late summer or during droughts.

NT3-7: A PSS1 wetland located in a ponded area of the stream on the downstream side of Haul Road.

2.4 TRIBUTARY NT-4

The boundaries of wetlands upstream of Haul Road (NT4-1, NT4-2, NT4-3, and NT4-4) were located by civil survey in 1992. The boundaries and characteristics of these wetlands are substantially the same as during the 1992 delineation. NT4-5, located downstream of Haul Road, was identified during the current survey, and its boundary is estimated.

NT4-1: PF01/PEM1 wetland on the upstream side of Haul Road. This area is semipermanently flooded because of detention of water behind the road bank and culvert.

NT4-2: Small areas of PEM1 wetland on alluvial shelves within steep-sided stream banks and at seeps at breaks in the stream bank.

NT4-3: PEM1 wetland in the narrow riparian zone of the upper reach of the stream.

NT4-4: A scrub-shrub/emergent (PSS1/PEM1) wetland area just upstream of Haul Road on a tributary of NT-4. This tributary joins NT-4 downstream of Haul Road.

NT4-5: This wetland was identified during the current survey. The wetland consists of a narrow fringe of PEM1 wetland on both sides of NT-4 in a short reach immediately downstream of Haul Road. The wetland and the adjacent, grassy areas are routinely mowed. The boundary is estimated.

2.5 TRIBUTARY NT-5

The boundaries of NT5-1 and NT5-2 were located by civil survey in 1992. The boundaries and characteristics of the previously identified wetlands were substantially the same as they were in 1992. NT5-3 and NT5-4 were identified during the current survey, and their boundaries are estimated.

NT5-1: PFO1/PEM1 wetland on upstream side of Haul Road bank.

NT5-2: This wetland area encompasses (1) the continuation of the NT5-1 forested wetland, (2) small areas of PEM1 wetlands on alluvial shelves and at seeps along both branches of the stream, (3) a small PFO1 wetland area at a seep on the upper reach of the west branch, and, (4) a small PSS1 area at the head of the east branch.

NT5-3: This PEM1 wetland, located immediately downstream of Haul Road, was identified during the current survey. The boundary is estimated.

The primary water source appears to be groundwater discharging at seasonal seeps. The area is occasionally mowed, and it appears that water is retained in the area, at least in part, in what appear to be ruts formed by the mowing equipment. The dominant vegetation species are soft rush, green bulrush (*Scirpus atrovirens*, OBL), fox sedge (*Carex vulpinoidea*, OBL), fringed sedge (*Carex crinita*, OBL), lurid sedge (*Carex lurida*, OBL), and black willow (*Salix nigra*, OBL). The soil is a grayish brown (10YR 5/2) silt loam with mottles (5YR 5/6), manganese concretions, and oxidized rhizospheres.

NT5-4: This emergent wetland, located within a forested area, was identified during the current survey. The stream channel in the wetland section is shallow. Dominant vegetation species include red maple (*Acer rubrum*, FAC), hog peanut (*Amphicarpa bracteata*, FAC), green bulrush, fringed sedge, jewelweed (*Impatiens capensis*, FACW), false nettle (*Boehmeria cylindrica*, FACW+), fowl manna-grass (*Glyceria striata*, OBL), lurid sedge, and water hemlock (*Cicuta maculata*, OBL). Hydrologic indicators include saturated soil, surface drainage patterns, surface water in the shallow stream channel, free water in the soil boring, and drift lines. The soil was gray (10YR 6/1) with mottles (5YR 5/8), manganese concretions, and oxidized rhizospheres. At a depth of 8 inches, the soil was gleyed (6/10Y).

2.6 TRIBUTARY NT-6

The wetland boundaries in the NT-6 drainage are estimated. NT6-1, NT6-2, NT6-3, and NT6-4 have been previously identified. The boundaries and characteristics of these wetlands are substantially the same as they were in the 1992 survey. NT6-1a was identified during the current survey.

NT6-1: A PFO1 wetland in a wide seep area located between a gravel road in the waste management area and Bear Creek.

NT6-1a: This previously unidentified PFO1 wetland is in the stream bottom between Haul Road and a gravel road in the existing waste management area. This is a seasonally flooded forested wetland that has groundwater as its primary water source. There was standing and flowing water on the surface. The surface was saturated throughout the wetland. Water was present in the soil borings. The soil was a gray (10YR 6/2) silt loam with mottles (7.5YR 4/6) and oxidized rhizospheres.

Dominant species included green ash (*Fraxinus pennsylvanica*, FACW), red maple, sycamore (*Platanus occidentalis*, FACW−), and sweetgum in the canopy and sapling layers. There was a dense ground-cover layer consisting of lurid sedge, fringed sedge, Frank's sedge (*Carex frankii*, OBL), water hemlock, jewelweed, green bulrush, soft rush, fowl manna-grass, lady's-thumb (*Polygonum persicaria*, FACW), and sensitive fern (*Onoclea sensibilis*, OBL).

NT6-2 and NT6-3: NT6-2 is a PSS1 wetland at the base of the road bank where the stream water has been detained behind the road bank and culvert. The PSS1 wetland grades into NT6-3, which is a PFO1 wetland in the NT-6 bottomland.

NT6-4: PFO1 wetland in the NT-6 headwaters.

2.7 UNMAPPED SEEP CHANNEL

BC-0: A seep channel that drains to Bear Creek was found between NT-4 and NT-5.
A wetland was identified along the channel during the current survey.

The dominant species included red maple, slippery elm (*Ulmus rubra*), and sweetgum in the canopy and sapling layers. Nepal grass, bugleweed (*Lycopus virginicus*, OBL), poison ivy (*Toxicodendron radicans*, FAC), and a grass (*Panicum* sp.) were dominant ground-cover species. The soil was at field capacity. Hydrologic indicators included surface drainage patterns, drift lines, silt, and water-stained leaf litter. There was no water on the surface on the day of the survey.

The soil had a 3 chroma and faint brownish-red mottles. Because the soil chroma color is greater than 2, this area does not meet the USACE jurisdictional wetland criteria. However, this area is classified as a palustrine forested wetland with a temporary flooding regime (PFO1A) under the Cowardin classification system (1979). Cowardin-classified wetlands that do not meet all three of the USACE criteria are not jurisdictional wetlands, and, thus, under normal conditions, activities in these areas are not subject to federal wetland protection regulations. The development of hydric soils that meet the USACE criteria depends on the future hydrology of the site. If the soil develops hydric characteristics as a result of inundation or saturation, the area would then meet the jurisdictional wetland criteria.

3. SUMMARY

On March 20, May 19, and May 22, 1998, field surveys were conducted to verify the wetland areas delineated in 1992 in the drainages of Bear Creek northern tributaries NT-1, NT-2, NT-3, NT-4, NT-5, and NT-6. The objective of these surveys was to determine whether the current wetland boundaries and wetland types in these areas were substantially the same as when initially identified and delineated in 1992.

Some of the wetland boundaries were delineated and located by civil survey and are accurate as mapped. The boundaries of the remaining wetlands are estimated. With the exception of one wetland in the NT-3 drainage, the sections of NT-2 and NT-3 downstream of Haul Road were not included in this survey.

The boundaries and characteristics of all of the previously identified wetlands were substantially the same as they were in the 1992 survey. Five wetlands were identified that had not been previously identified. These include (1) a pond and emergent wetland area in the transmission line right-of-way in the NT-1 drainage, (2) a small area of forested wetland in the NT-3 drainage, (3) an emergent wetland and a small forested wetland area in the NT-5 drainage, and (4) a forested wetland in the NT-6 drainage.

The boundaries of NT1-2, NT1-5, NT2-8, NT3-6, NT3-7, NT4-5, NT5-3, NT5-4, BC-0, and all of the wetlands in the NT-6 drainage are estimated. The boundaries of the remaining wetlands are accurate, based on a 1992 delineation and civil survey.

4. REFERENCES

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetland and deepwater habitats of the United States. FWS/OBX-79/31. U.S. Fish and Wildlife Service, Washington, D.C.

Kollmorgen Instruments Corporation. 1992. Munsell Soil Color Charts. Kollmorgen Instruments Corporation, Newburgh, New York.

Reed, P. B., Jr., 1988. National list of plant species that occur in wetlands: National summary. U.S. Fish and Wildlife Service Biological Report 88 (24).

Rosensteel, B.A., and C. C. Trettin. 1993. Identification and characterization of wetlands in the Bear Creek Watershed. Y/TS-1016. Lockheed Martin Energy Systems, Environmental Management Division, Oak Ridge Y-12 Plant.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Technical Report Y-87-1. Waterways Experiment Station, Vicksburg, Mississippi.