TETRA TECH

May 1, 2017

Ms. Katherine J. Marcopul
Deputy State Historic Preservation Officer
Mail Code 501-04B
NJDEP – Historic Preservation Office
PO Box 420
Trenton, NJ 08625-0420

Subject: Response to Letter of Comment **HPO-D2017-055** (**HPO Project # 16-1695-3**)
U.S. Environmental Protection Agency (USEPA) – Section 106 Consultation
Phase IA Background Review and Archaeological Assessment, Ringwood Mines/Landfill Superfund Site **(NJD980529739)** Operable Unit (OU) 2
Borough of Ringwood, Passaic County, New Jersey

Dear Ms. Marcopul:

Enclosed in response to your letter of comment of April 7, 2017, to Mr. Steve Ferreira, Regional Historic Preservation Officer, Region 2, USEPA, is a re-formatted, printed, and bound copy of the Phase IA background review and archaeological sensitivity assessment of OU-2 of the Ringwood Mines/Landfill Superfund Site. In addition, a PDF version of the report is included on the enclosed CD.

I would appreciate receiving an acknowledgement indicating that this submittal meets the specifications listed in the letter of comment. Should you have any questions or concerns regarding the enclosed materials, please contact me by e-mail at chris.borstel@tetratech.com or by telephone at 973-630-8358.

Sincerely yours,

CHRISTOPHER L. BORSTEL

Christopher L. Borstel, Ph.D., RPA
Cultural Resources Specialist

Encl. (2)

Cc: R. Delahunty, Tetra Tech CES
G. DiPippo, Cornerstone
S. Ferreira, USEPA Reg. 2

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Phase IA Background Review and Archaeological Assessment
Ringwood Mines/Landfill Superfund Site Operable Unit 2
Borough of Ringwood, Passaic County, New Jersey

USEPA ID No. NJD980529739

NJ HPO Project # 16-1695-3

Prepared for

Ford Motor Company

Prepared by

TETRA TECH

6 Century Drive, 3rd Floor
Parsippany, NJ 07054

On behalf of

cornerstone
A TETRA TECH COMPANY

100 Crystal Run Road, Suite 101
Middletown, NY 10941

March 2017

Phase IA Background Review and Archaeological Assessment
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Christopher L. Borstel, Ph.D., RPA, Principal Investigator
Evan B. Robinson, M.A.
Gail M. Hellman

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March 2017

Report Certification

The material and data in this report were prepared under the supervision and direction of the undersigned.

Tetra Tech, Inc.

Christopher L. Borstel

Christopher L. Borstel, Ph.D., RPA
Cultural Resources Specialist/Archaeologist

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Management Summary

This study assesses the potential of planned remediation activities to result in adverse effects at three locations in the Borough of Ringwood, Passaic County, New Jersey. These localities comprise Operable Unit 2 (OU-2) in the 500-acre Ringwood Mines/Landfill Superfund Site (Site). The Site is listed by the U.S. Environmental Protection Agency (USEPA) on the National Priority List (NPL) as NJD980529739. The localities comprising OU-2 are the Peters Mine Pit (PMP) Area and the O'Connor Disposal Area (OCDA), which adjoin one another on Peters Mine Road, and the Cannon Mine Pit (CMP) Area, located approximately 1 mile to the south between Horseshoe Bend Road and Van Dunk Lane. The study provides information and recommendations in support of consultations between USEPA and the New Jersey Historic Preservation Office (HPO) under Section 106 of the National Historic Preservation Act and other applicable statutes and regulations.

Pursuant to the Record of Decision (ROD) of June 30, 2014, the U.S. Environmental Protection Agency (USEPA) selected a remedial action plan for OU-2 that generally involves excavation of waste and contaminated soil, filling, consolidation of fill and waste materials, construction of Engineered Geotextile/Soil Caps, site grading, and restoration of vegetation. Connected to the remediation effort, the remedial action plan includes construction of a Borough Recycling Center following remediation activities at the OCDA.

Remediation activities will result in ground disturbances at the three elements of OU-2 and will also cause minor changes to the topography, vegetation, and built environment. Such alterations potentially could affect archaeological resources and other historic properties, if present. Based on the nature and extent of remediation activities, OU-2 has a combined direct effects Area of Potential Effects of approximately 20.63 acres and an indirect effects APE limited to the immediate vicinities of three OU-2 localities.

Background research, involving review of HPO files, the records of the New Jersey State Museum (NJSM), and the New York State Historic Preservation Office (NY-SHPO) found that there are no inventoried archaeological sites and no inventoried aboveground historic resources at or in the immediate vicinity of the three localities comprising OU-2. Field inspection in mid-January 2017 observed no features or properties warranting cultural resources inventory within the direct effects APE of OU-2. Historic research found that the Ringwood area was one of the leading sources of iron ore in New Jersey from the early seventeenth to the early twentieth centuries. Both Peters Mine and Cannon Mine produced important quantities of ore during the period. Repeated alterations of the mines while they were being worked and post-abandonment demolition, filling, and previous remedial activities mean that the possibility is quite low that intact, significant archaeological features or deposits are present at either mine. Use of the OCDA for dumping mine spoil while the mines were in operation and post-abandonment activities similarly indicate low archaeological sensitivity in this area. Post-remediation restoration or redevelopment activities are judged to have low potential to adversely affect any aboveground historic resources that may be present in the immediate vicinity.

The study concludes that the proposed remediation activities will result in no effect to historical resources. It is recommended that the proposed remediation and restoration activities may proceed as planned, without further cultural resources study or documentation. In a letter of comment of April 7, 2017, HPO concurred with this assessment (HPO Project No. 16-1695-3 / HPO-D2017-055).

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I. Introduction

Tetra Tech, Inc., Parsippany, New Jersey (Tetra Tech), under Subcontract to Cornerstone Engineering Group, LLC, conducted a Phase IA archaeological sensitivity assessment of three Land Areas of Concern (Land ACs) within the 500-acre Ringwood Mines/Landfill Superfund Site (Site), which is situated in the Borough of Ringwood, Passaic County, New Jersey (Figure 1). The U.S. Environmental Protection Agency (USEPA) Site ID No. is NJD980529739. The three Land ACs are designated as the Peters Mine Pit (PMP) Area, the O'Connor Disposal Area (OCDA), and the Cannon Mine Pit (CMP) Area (Figure 2). Together these three Land ACs comprise Operable Unit No. 2 (OU-2) of the Ringwood Mines/Landfill Superfund Site.

Pursuant to the Record of Decision (ROD) of June 30, 2014, USEPA has selected a remedial action plan for OU-2 that generally involves excavation of waste and contaminated soil, filling, consolidation of fill and waste materials, construction of Engineered Geotextile/Soil Caps, site grading, and restoration of vegetation. Connected to the remediation effort, the selected remedial action plan includes construction of a Borough Recycling Center over the Engineered Soil Cap within OCDA.

The Site is situated in the former Ringwood iron mines area of northern Passaic County, which saw numerous episodes of iron mining over a period of over two hundred years. Owing to the long history of mining in Ringwood and to anticipated ground disturbances from remediation activities, USEPA requested a study to evaluate potential effects on archaeological historic resources that might be located within the OU-2 remediation area. This Study provides cultural resources information that assists USEPA in its compliance with cultural resources requirements of CERCLA/SARA and Section 106 of the National Historic Preservation Act, 1966, as amended.

This Phase 1A review and assessment involved several subtasks:

- Background research to understand the historical context of iron mining operations, prior remediation actions at the three Land ACs, and other potential archaeological or historical resources (e.g., prehistoric Native American archaeological sites);
- File review for historic resources within a 1-mile radius study area at the New Jersey Historic Preservation Office (HPO), Trenton, the archaeological site files of the New Jersey State Museum (NJSM), Trenton, and through New York State Historic Preservation Office's (NY-SHPO) online Cultural Resources Information System (NY-CRIS);
- Field inspection of the three Land ACs comprising OU-2; and
- Synthesis of the foregoing information to evaluate the potential for archaeological resources in the OU-2 remediation area.

The study was conducted in December 2016 and January 2017 by Tetra Tech cultural resources specialist Christopher L. Borstel, RPA, Ph.D., with the assistance of Evan Robinson, M.A., and Gail Hellman. Sydne B. Marshall, RPA, Ph.D., provided technical oversight and a peer review of this study.

As originally prepared, this document was formatted as attachments to a letter summarizing the findings of a Phase 1A-level background review and archaeological sensitivity assessment for OU-2. USEPA submitted the letter report to HPO as part of the Section 106 consultation process in early March 2017. On April 7, 2017, HPO concurred with the findings of the letter report, but requested that the formatting of the report be revised to conform to its "Guidelines for Preparing Cultural Resources Management Archaeological Reports" (July 2000) (Appendix A). This version of the document, identical to that HPO reviewed except for changes necessitated by the change in format, has been prepared in response to the HPO request.

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II. Location and Setting

The three Land ACs comprising OU-2 are situated in a moderately rugged section of New Jersey's Highlands physiographic province 0.6 to 1.7 miles south of the New York State border and approximately 16.5 miles northwest of the Passaic County Courthouse in Paterson. Ancient metamorphic and igneous rocks in the Highlands contain numerous small ore bodies that were economically important from the Colonial era to the early twentieth century (Harper 2013:147-151). The region produced copper, zinc, and, most widespread, iron ores in scattered districts (Bayley 1910; Cook 1868; Hotz 1952; Lenik 1999; Ransom 1966). This zone of mineral deposits trends northeast-southwest through northwestern New Jersey and South into adjoining New York State. Situated in the Ramapo Mountains of northern Passaic County, the Ringwood iron ore district comprises about a dozen mines and prospects in an area about 1 mile long by 0.75 miles wide. The district is immediately north and west of Ringwood village center, at the intersection of Margaret King Avenue (also called Ringwood Avenue, County Route 698) and Peters Mine Road (Hotz 1952:216, Figure 46). Wanaque Reservoir is to the south, and Monksville Reservoir is west of the district.

The three Land ACs comprising OU-2 are situated at elevations of approximately 500 to 565 feet above sea level in and adjacent to low order stream valleys tributary to the Ringwood River (Figure 2). The PMP Area and adjacent OCDA are situated between the stream valley and associated wetlands and a steep 400-foot-high hill locally known as Whaleback Mountain. Another hill of similar height, Hope Mountain, rises just to the north of the PMP Area. The CMP Area is on a ridge spur overlooking a small valley south of Whaleback Mountain and about 1 mile south of the PMP Area. The region of OU-2 is lightly populated and has a mix of single family residential homes, commercial buildings, and municipal facilities strung along the historical roads and along newer development roads ending in cul-de-sacs. Rugged land outside valley floors is forested and includes Ringwood State Park and other woodlands managed by the New Jersey Department of Environmental Protection (NJDEP).

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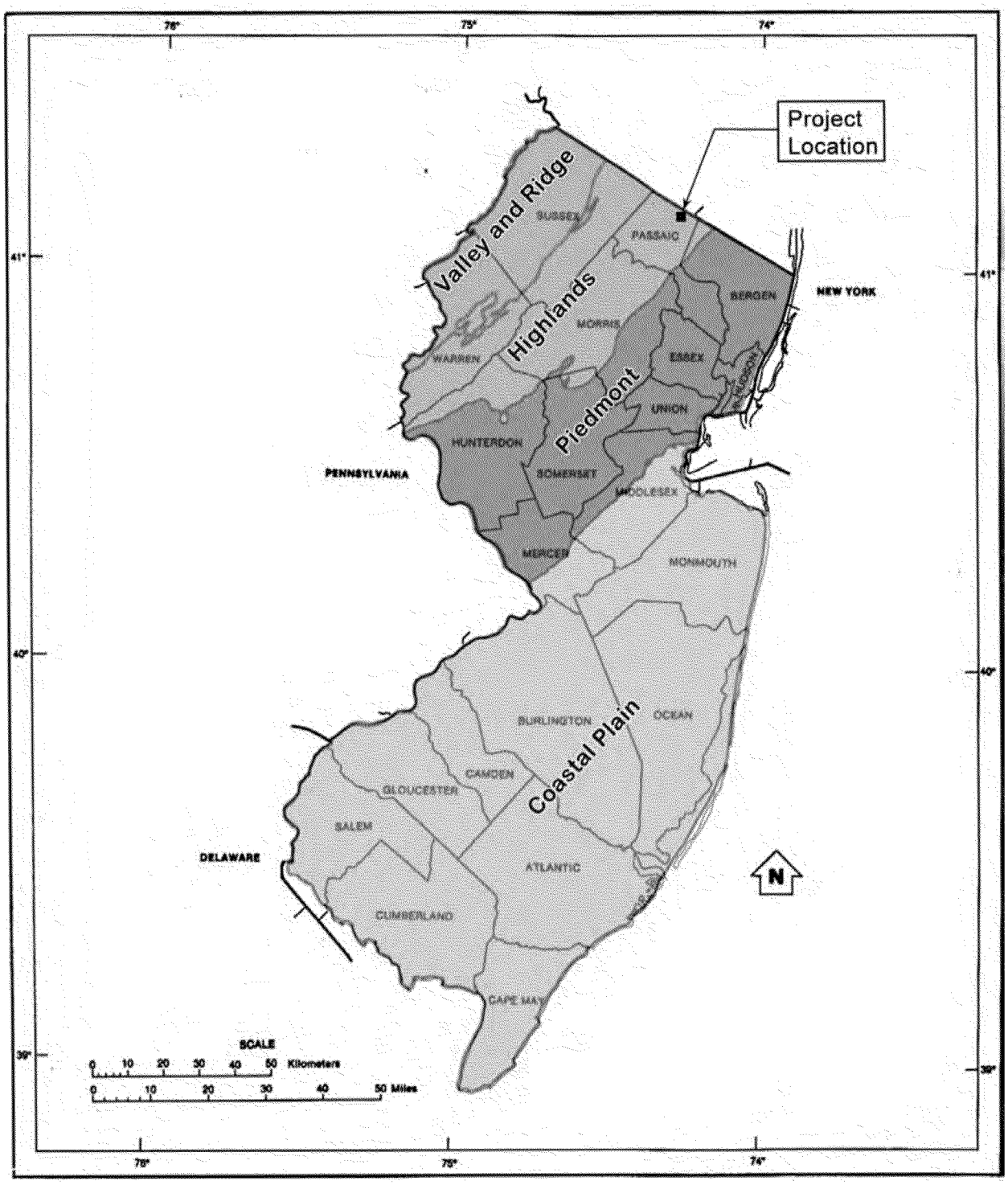

Figure 1: Project Location with New Jersey's Physiographic Provinces.

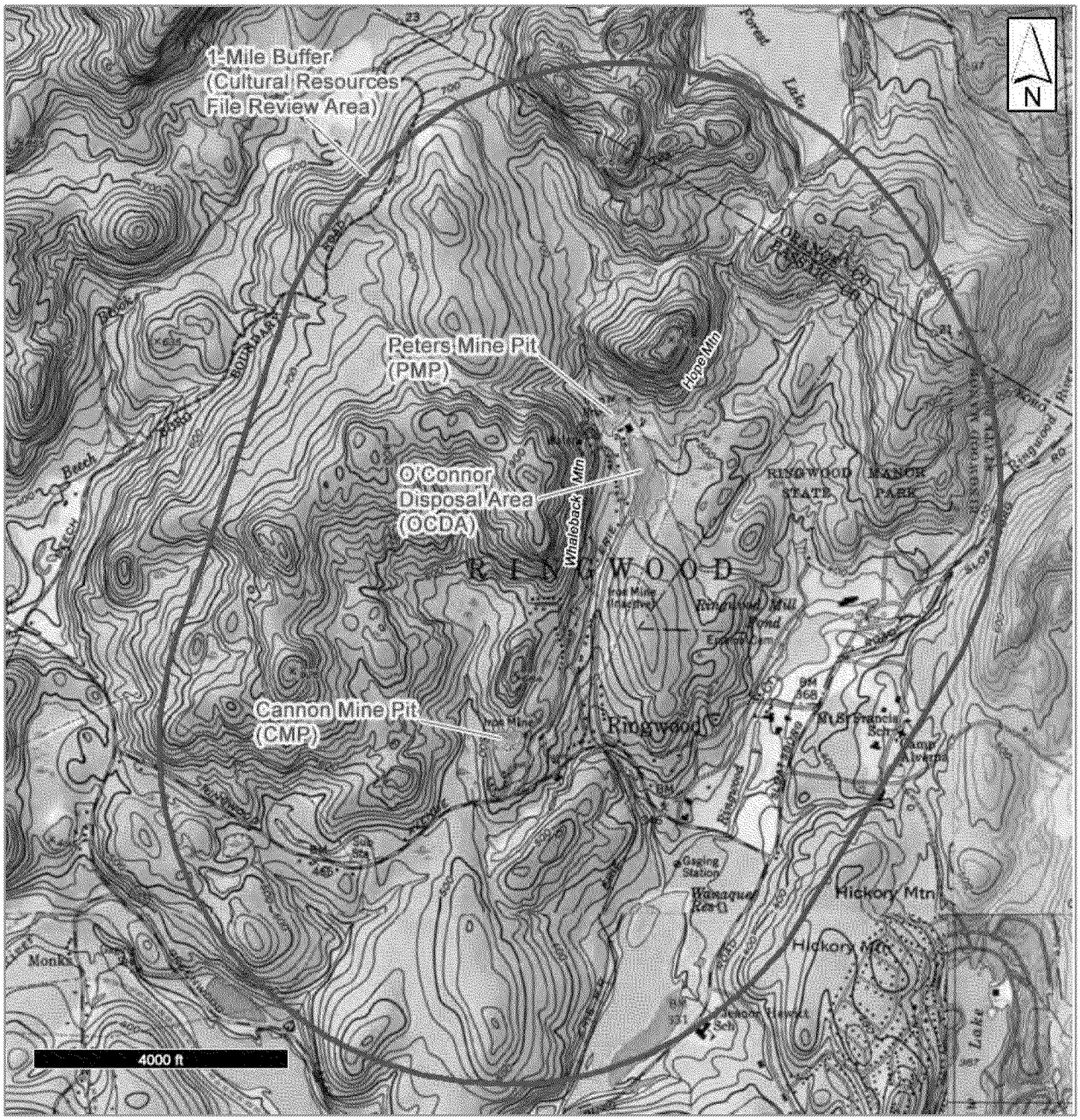

Figure 2: Project Area.

III. Remediation Activities and the Area of Potential Effects

At the time of preparation of this Phase 1A assessment, a Draft Final Remedial Design for OU-2 was completed (Cornerstone 2016) and formed the basis for defining the limits of disturbance. The USEPA completed its review of the Draft Final Remedial Design, and the Final Remedial Design is currently being prepared. The limits of disturbance are unchanged from the Draft Final Remedial Design. Figures 3a to 3d provide final grading plans for the three Land ACs and the site plan for the construction of the planned Borough of Ringwood Recycling Center in the OCDA per the remedial action plan selected by the USEPA.

In accordance with the USEPA's 2014 ROD, the remediation activities at the three Land ACs may be summarized as follows:

PMP Area (Figure 3a)

- Excavation of soil and fill to the water table, unless drums and paint waste are found to extend below the water table and can be removed, in which case, excavation will also include such materials;
- Segregation of excavated materials for re-use or off-site disposal based on the nature of the materials and the results of laboratory analyses, as applicable;
- Placement of compacted fill to achieve grades above the water table and provide overall grading of the area as necessary for Engineering Cap construction;
- Installation of an Engineered Geotextile/Soil Cap as an Engineering Control and restoration with indigenous vegetation consistent with Ringwood State Park; and
- Institutional Controls and long-term monitoring, maintenance, and reporting.

The remedial action and restoration plans for the PMP Area focus on the former open mine pit, but are not concerned with the 1940s-era ruins of mine buildings on the hillslope southwest of the pit, nor with the abandoned underground mine shafts. After remediation is complete at the PMP Area, vegetation restoration will be completed both on the cap and in the immediately surrounding area, including the staging area at the end of the paved portion of Peters Mine Road.

OCDA (Figures 3b and 3c)

- Excavation of fringe area fill and consolidation within the OCDA;
- Installation of an Engineered Geotextile and Soil Cap followed by redevelopment of the area above the Engineered Cap as a Recycling Center for the Borough of Ringwood;
- Construction of the Recycling Center above the Engineered Cap once installed which would also function as a protective feature above the cap (e.g., asphalt pavement, etc.);
- Additional Engineering Controls (e.g. fencing, signs, etc.) to control access;
- Restoration of vegetation in areas outside of the Engineered Cap;
- Restoration/mitigation of wetlands disturbed by the remedy implementation; and
- Institutional Controls and long-term monitoring, maintenance, and reporting.

The new Borough Recycling Center will replace an existing town facility on Cable House Road.

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CMP Area (Figure 3d)

- Excavation of drums of waste, if any are encountered, and proper offsite disposal;
- Placement of compacted fill to promote proper drainage of the area;
- Installation of an Engineered Geotextile/Soil Cap as an Engineering Control and restoration with vegetation;
- Additional Engineering Controls (e.g., fence, boulders, signs, etc.) to control access; and
- Institutional Controls and long-term monitoring, maintenance, and reporting.

Remediation and restoration at the three Land ACs will involve varying amounts of disturbance of existing ground within the limit of disturbance (LOD), depending upon the specific Land AC.. Excavation, consolidation and/or relocation of waste/fill, movements of heavy equipment, and other construction activities all have the potential for disturbance of soil and ground features. Vegetation restoration would involve slight to modest disturbance, but only at the PMP Area will vegetation restoration extend substantially beyond the LOD as necessary for blending in with the surrounding ground surface elevation and existing woodlands. Areas where ground disturbance will or may occur comprise the area of potential effects (APE) for archaeological resources. The APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (Title 36 Code of Federal Regulations [CFR] Part 800.16(d)). The APE is often conceptually subdivided into the direct effects APE, where ground disturbance might take place as just described due to excavation, construction, and maintenance activities. In addition, there is the indirect effects APE, where visual, vibrational, or auditory effects might occur.

With the exception of the construction of the Borough Recycling Center on part of OCDA Engineered Soil Cap, the long-term permanent visual result of remediation activities in OU-2 will be to increase surface grades by up to a few feet and changes in contour, which in the long term, will be ameliorated by revegetation of the remediated areas with appropriate native vegetation. The planned Borough Recycling Center will be a largely paved, all-weather work yard facility with a single small, one-story building and an open-bay structure for keeping different types of recyclables separate. The low height of these elements means that, like the landscape alterations, the potential for visual effects is limited to the immediate vicinity of the involved remediation and restoration area. Consequently, the remainder of this analysis focuses primarily on potential direct effects of the remediation activities.

Table 1 details key locational information about the three Land ACs and provides area estimates for the direct effects APE. Collectively, OU-2 has a direct effects APE of approximately 20.63 acres. As noted, the indirect effects APE is limited to the immediate vicinity of areas planned for remediation and restoration.

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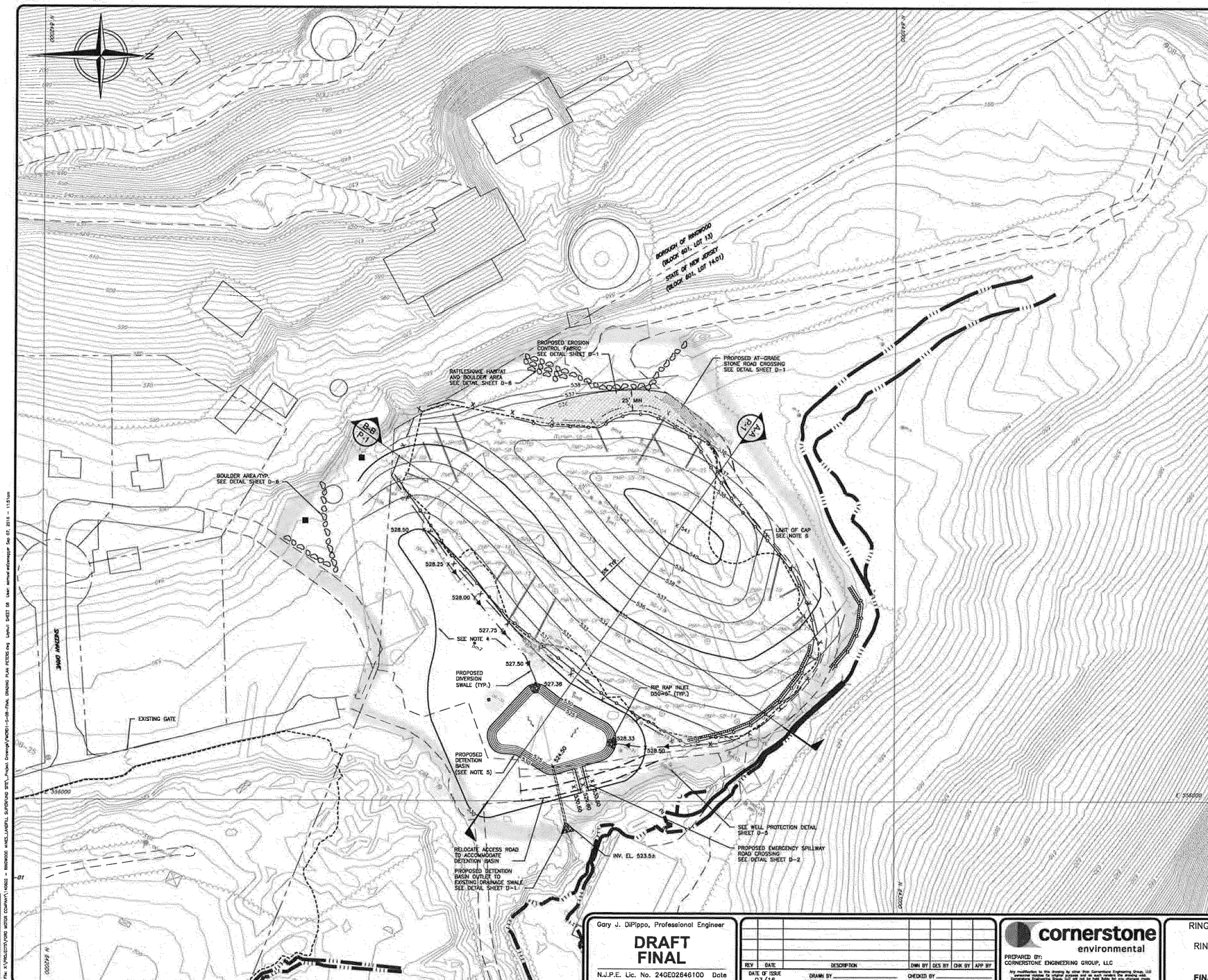
Table 1: OU-2 Locations of Land Areas of Concern and Dimensions of Direct Effects APEs

	PMP Area	OCDA	CMP Area
Location *[Street addresses have not been assigned to the subject parcels, or are not available in the sources consulted.]*	West side of Peters Mine Rd., 0.07 mile north of Sheehan Dr.	East side of Peters Mine Rd., from 0.03 mile north of Cable House Rd. to 0.06 mile north of Sheehan Dr.	0.08 mile north-northwest of the end of Horseshoe Bend Rd. and immediately west and south of the end of Van Dunk Ln.
Block and Lot	Block 601, Lot 14.01 (nearly the entirety of PMP Area) and Block 601 Lot 13 (~0.29 acre of LOD and 0.63 acre additional restoration area)	Block 601, Lot 14 (nearly the entirety of OCDA) and Block 601, Lot 14.01 (~0.16 acre at northern end)	Block 603, Lot 13
Owner of Record	NJDEP (Lot 14.01) is the primary owner and Borough of Ringwood (Lot 13)	Borough of Ringwood (Lot 14) is the primary owner and NJDEP (Lot 14.1)	Borough of Ringwood
Centroid Lat., Long.	41.146589°, -74.269102°	41.143743°, -74.267320°	41.132579°, -74.275330°
Approx. Dimensions	320 x 575 feet (remediation area); 550 x 550 feet (restoration area)	670 x 1,350 feet	370 x 510 feet, plus 575-foot-long graveled access road
LOD	3.45 acres	11.49 acres	2.49 acres
Additional Work Areas	~2.9 acre additional restoration area	None	0.1 acre addition restoration area; 0.2 acre along existing ~15 x 575 ft. gravel access road
Direct Effects APE	6.35 acres	11.49 acres	2.79 acres

Sources: Cornerstone Environmental, Google Earth, and NJ GeoWeb, October 2016-January 2017

Key: APE—Area of Potential Effects; Lat., Long.—Latitude and Longitude in decimal degrees; LOD—Limit of disturbance.



LEGEND:

FOR ADDITIONAL LEGEND, SEE SHEET NT-1

Restoration Area

Figure 3a: PMP Grading Plan

NOTES:

1. FOR ADDITIONAL NOTES SEE SHEETS PMP-1 AND NT-1.
2. RELOCATE PERMANENT CHAINLINK FENCING AROUND LIMIT OF WORK.
3. AREA SHALL HAVE GEOTEXTILE FABRIC COVER WITH SOIL FILL, TOPSOIL AND VEGETATIVE COVER. SEDIMENT BARRIERS SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.
4. SEE DRAWING WL-2 FOR FOR ADDITIONAL SITE RESTORATION INFORMATION
5. DETENTION BASIN SHALL PROVIDE 33,800 CUBIC FEET OF STORAGE AND 0.2 AC OF SURFACE AREA. SEE DETAIL SHEETS D-1 AND D-2.
6. ENTIRE AREA WITHIN LIMIT OF ATTAINMENT TO RECEIVE FINAL COVER. SEE DETAIL SHEET D-4.
7. ENTIRE FENCE AROUND PMP AREA TO BE REMOVED AT COMPLETION OF WORK.

50 25 0 50 100 150

SCALE: 1"=50'

Gary J. DiPippo, Professional Engineer

DRAFT FINAL

N.J.P.E. Lic. No. 24GE02646100 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 03/16 DRAWN BY ____ DESIGNED BY ____ CHECKED BY ____ APPROVED BY ____

cornerstone environmental

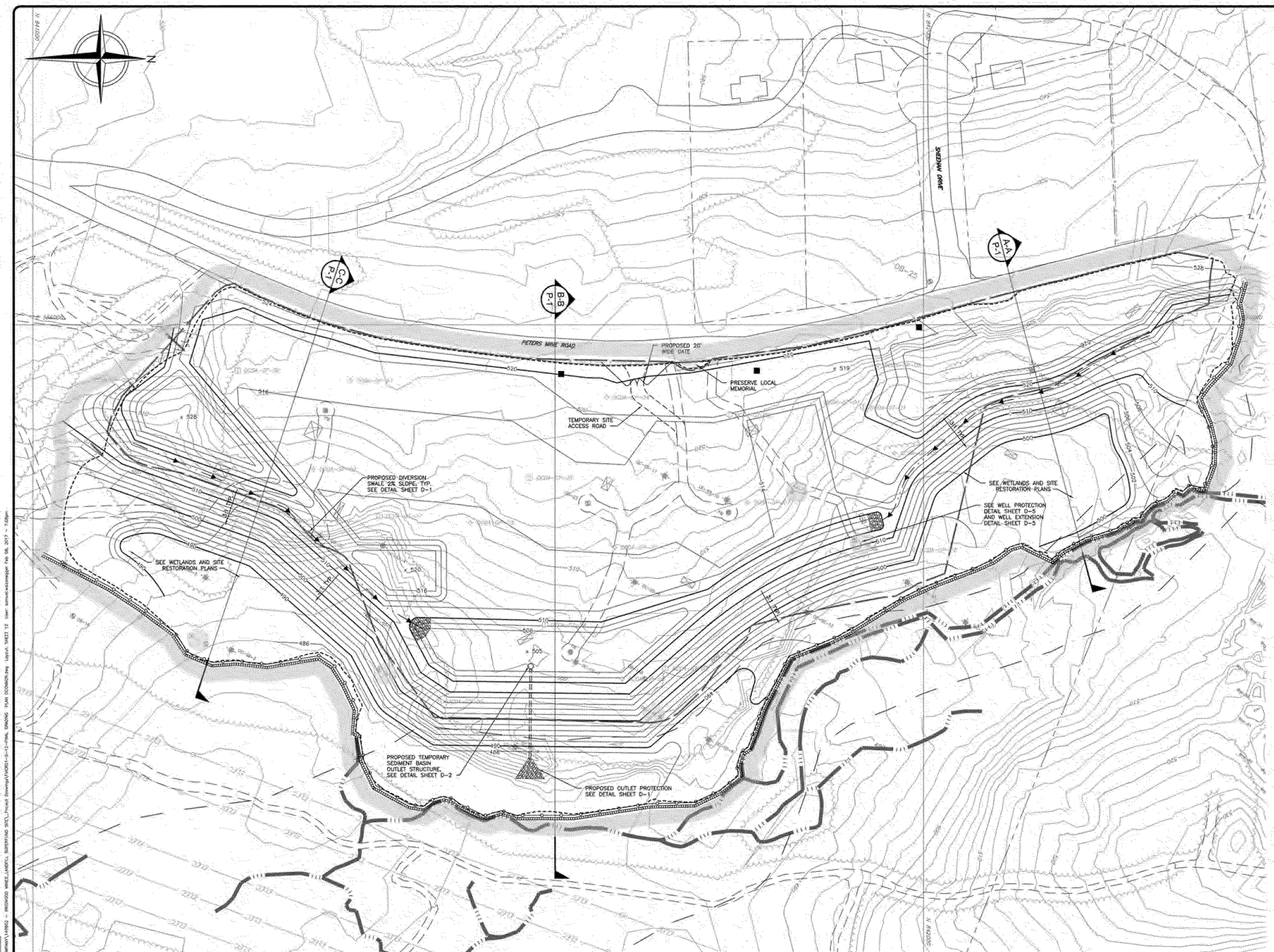
PREPARED BY: CORNERSTONE ENGINEERING GROUP, LLC

RINGWOOD MINES/LANDFILL SUPERFUND SITE
OU2 DRAFT FINAL REMEDIAL DESIGN
RINGWOOD, PASSAIC COUNTY, NEW JERSEY

FINAL GRADING PLAN - PETERS MINE PIT AREA

SHEET NO. **PMP-4**

PROJECT NO. 140802



LEGEND:

FOR ADDITIONAL LEGEND, SEE SHEET NT-1

Restoration Area

Figure 3b: OCDA Grading Plan

NOTES:

1. FOR ADDITIONAL NOTES SEE SHEET NT-1.
2. RELOCATE PERMANENT CHAINLINK FENCING AROUND LIMIT OF WORK, AS NECESSARY.
3. CAP AREA SHALL HAVE GEOTEXTILE FABRIC COVER WITH SOIL FILL, TOPSOIL AND VEGETATIVE COVER, SEE DETAIL SHEET D-4. SEDIMENT BARRIER AND TEMPORARY SEDIMENT BASIN AND DIVERSION SWALES SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.
4. FINAL GRADES CORRESPOND TO LAYOUT OF FUTURE RECYCLING CENTER CONSTRUCTION BY THE BOROUGH OF RINGWOOD.

Gary J. DiPippo, Professional Engineer

N.J.P.E. Lic. No. 24GE02646100 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 02/17 — DRAWN BY SHW — DESIGNED BY SHW/GDP/MS — CHECKED BY GDP/MS — APPROVED BY GDP

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RINGWOOD MINES/LANDFILL SUPERFUND SITE
OU2 FINAL REMEDIAL DESIGN
RINGWOOD, PASSAIC COUNTY, NEW JERSEY

FINAL GRADING PLAN - O'CONNOR DISPOSAL AREA

SHEET NO. **OCDA-4**

PROJECT NO. 140802

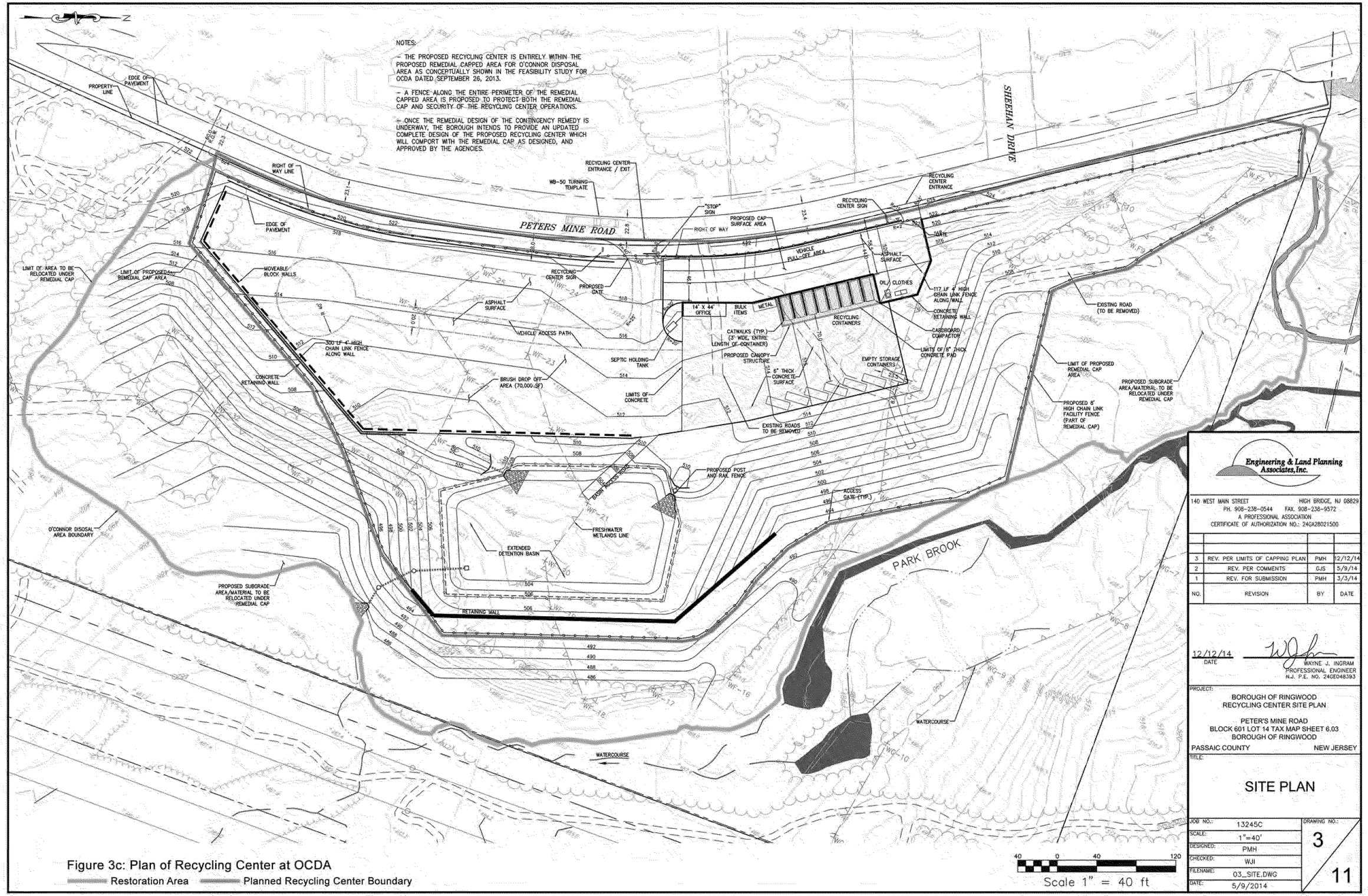
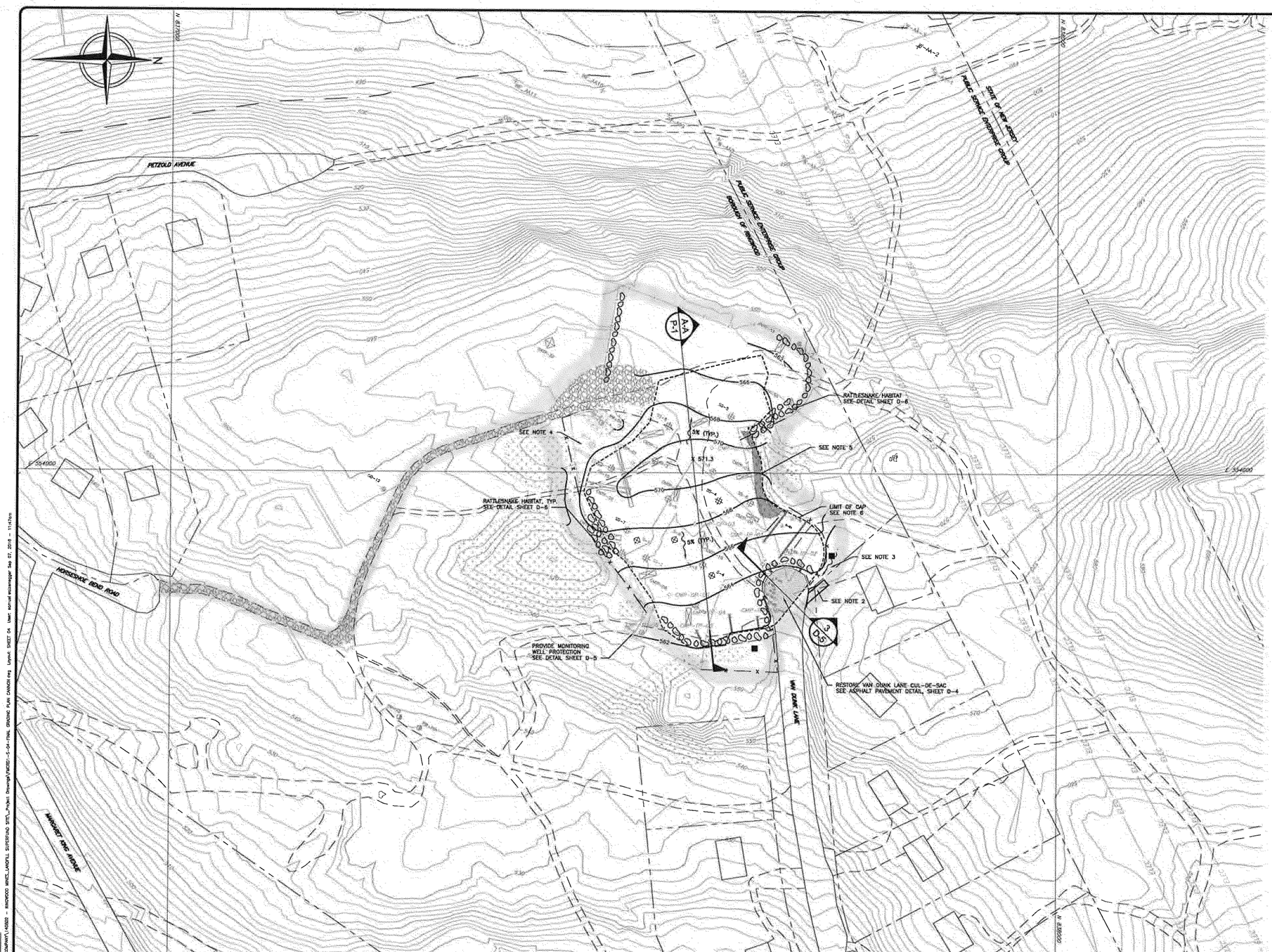


Figure 3c: Plan of Recycling Center at OCDA

Restoration Area Planned Recycling Center Boundary

Source: Borough of Ringwood



LEGEND:

FOR ADDITIONAL LEGEND, SEE SHEET NT-1

- EXCAVATE FILL/WASTE AND RESTORE VAN DUNK LANE CUL-DE-SAC
- AREA OF SHALLOW FILL/WASTE PULL BACK (SEE NOTE 4)
- AREA OF BEDROCK OUTCROP FILL/WASTE PULL BACK (SEE NOTE 5)

Restoration Area

Figure 3d: CMP Grading Plan

NOTES:

1. FOR ADDITIONAL NOTES SEE SHEET NT-1.
2. MAINTAIN ACCESS FOR RESIDENTIAL DRIVEWAY DURING EXCAVATION AND RESTORATION OF VAN DUNK LANE CUL-DE-SAC.
3. MAINTAIN POSITIVE DRAINAGE, MINIMUM 1% SLOPE TOWARDS CUL-DE-SAC, IN AREA OUTSIDE LIMIT OF ATTAINMENT.
4. AREA OF SHALLOW FILL/WASTE SHALL BE EXCAVATED AND PLACED UNDER THE FINAL COVER. EXCAVATED AREA SHALL BE RESTORED WITH CLEAN FILL, TOPSOIL AND VEGETATIVE COVER.
5. WHERE LIMIT OF ATTAINMENT BORDERS ROCK OUTCROP, SCRAPE OFF SUPERFICIAL FILL/WASTE, IF ANY, AND PLACE UNDER THE FINAL COVER.
6. ENTIRE AREA WITHIN LIMIT OF ATTAINMENT TO RECEIVE FINAL COVER. SEE DETAIL SHEET D-4.

50 25 0 50 100 150

SCALE: 1"=50'

Gary J. DiPippo, Professional Engineer

DRAFT FINAL

N.J.P.E. Lic. No. 24GE02646100 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 03/16 DRAWN BY ____ DESIGNED BY ____ CHECKED BY ____ APPROVED BY ____

cornerstone environmental

PREPARED BY: CORNERSTONE ENGINEERING GROUP, LLC

RINGWOOD MINES/LANDFILL SUPERFUND SITE
OU2 DRAFT FINAL REMEDIAL DESIGN
RINGWOOD, PASSAIC COUNTY, NEW JERSEY

FINAL GRADING PLAN - CANNON MINE PIT AREA

SHEET NO. **CMP-3**

PROJECT NO. 140802

IV. Historical Background

The following background review summarizes numerous sources, including Cook (1868), Bayley (1910), Hotz (1952), Ransom (1966), Greenwood (1975), American Society of Mechanical Engineers (1978), and Lenik (1999). Historical images and maps of Ringwood district iron mines are found in Ransom (1966), Lenik(1999), Iron Miners (2011), and New Jersey Geological and Water Survey (2011). Images of the contemporary condition of the Peters Mine and associated aboveground ruins are provided by AbandonedMines.net (2017) and Mindat.org (2017).

Colonial settlement of the Ramapo Mountains of northern New Jersey began in the mid-eighteenth century after the discovery of valuable minerals, notably the ores of iron and zinc. Settlers established mines that formed the nuclei of villages and dispersed rural settlement on both sides of the New Jersey-New York border. Key mining areas were Ringwood and Sterling Hill in New Jersey and Sterling Lake in New York. Ringwood was settled about 1742 as a result of the development of iron mines. Of particular importance at Ringwood was magnetite iron ore, which was of relatively high quality. The mining of this ore helped support the local economy from Colonial times into the early twentieth century.

In the eighteenth century, several mine pits operated in the Ringwood area. Among the most important of these mines were Peters Mine and Cannon Mine. Both mines opened around 1740, and a blast furnace was constructed nearby to produce pig iron and other products from the local ore. Cornelius Board, a Welsh miner, partnered with the Ogden family of Newark to begin these mines and to construct the earliest infrastructure for ironmaking. By 1765, Board and the Ogden family sold their interests to the American Iron Company, run by Peter Hasenclever. Hasensclever used the Ringwood mines and blast furnace to build up his iron production company into a Colonial-era business empire. In the 1760s and 1770s, in the mode of many rural American entrepreneurs on the cusp of the Industrial Revolution, he encouraged development of the Ringwood area by building a grist mill, saw mill, workers' houses, and four new iron forges.

Around 1771, Hasenclever returned to England and was replaced by Robert Erskine, who was instrumental in operating Ringwood area mines, furnaces, and forges in support of the American cause during the Revolutionary War. Iron produced by Ringwood supplied the Continental Army with iron tools and supplies. Erskine also became involved with helping Gen. George Washington with his military campaigns by producing over 200 highly accurate maps for the army. In addition, he proposed and designed an iron chain that spanned the Hudson River at West Point, which prevented British warships from sailing up the river to Albany.

In 1764, there were eight blast furnaces and 79 forges in New Jersey, and by 1834 there were 12 blast furnaces and 109 forges. The number of open mines and furnaces throughout the state would rise and fall with the market and as new, larger mining operations opened up in other parts of the country. The financial depression in 1873 created a drop off in production and forced mines to close. By 1879, the economy was beginning to recover, and iron ore production increased again. In 1880, New Jersey had the most mines open that it ever had, but by 1885 ore production slowed because of the discovery and development of iron ore from the Lake Superior region and the growth of the steelmaking industry closer to those ores in Pennsylvania and Ohio. There was a boom in 1899, with idle mines reopening in the Ringwood area, as well as in Morris and Warren counties. Around the beginning of the twentieth century, iron ore prices fluctuated sharply, and many existing iron mines cycled between activity and idleness as the price of ore rose and fell.

Mirroring patterns in many early, small-scale mining districts in America, the production of Peters and Cannon Mines expanded and contracted through the nineteenth century. The annual production of these mines was subject to national economic trends, which influenced market demand, and on the supply of ores within the individual mine pits and mines. Peters and Cannon Mines were two of the largest of the Ringwood group, and for decades they were among the highest producers in the area. After the death of Robert Erskine

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in 1780, the mines seem to have had limited production until the 1830s, when Peters and Cannon Mines were reopened for a few years by new owners who were unable to sustain their business.

Cannon Mine was then worked almost continually between 1855 and 1879, but during much of this period

Peters Mine was apparently idle. A boom in iron ore production at Ringwood around 1880 mirrored that in New Jersey as a whole, when the number of iron mines in the state reached its all-time peak. During this ore boom, the Ringwood mines produced 896,000 tons of ore.

Production in New Jersey and in Ringwood slowed a few years later, however, high-quality taconite iron ore had been discovered in the Lake Superior region in the mid-1880s. Taconite ore was high-quality, and could be mined and delivered more cost effectively to the iron and steel works in Ohio and Pennsylvania. By 1890, the Cannon and Peters Mines were the only remaining mines in the area still operating; however, Peters was soon declared to be played out. As it turned out, the declaration that Peters Mine was exhausted was four decades premature. Production continued and, in 1899, there was another local iron boom, but, soon after, there was no longer a local furnace to process the ore. The mines closed in 1931 and were acquired by the State of New Jersey in 1936.

A final chapter in the history of Peters Mine began with its takeover by the War Materials Production Board in 1942. The federal government then contracted with the Allen Wood Steel Company to put the mine into standby condition, a process that took a year and cost over $3.9 million (over $54 million in 2016 dollars).

During reconditioning, all the old wood frame buildings comprising the surface elements of the mine were demolished and were replaced with modern concrete and wood structures. The ruins of the structures from the 1942-1943 reconditioning are the ones present in and around the PMP Area today. Following reconditioning; however, virtually no ore was mined at Peters. Nor would any significant mining take place there over the next decade and a half, as the mine passed back and forth between several owners and the federal government. By 1961, Peters Mine had been stripped of saleable machinery and equipment and efforts to keep the mine in operating condition ceased.

Surface structures for Cannon Mine were demolished around this time. Cannon Mine Shaft featured a 50-foot-tall head frame, which was a prominent local feature into the 1950s, long after the mine closed. Aerial imagery from HistoricAerials.com shows that the head frame and associated buildings had been removed prior to 1965.

In 1965, Ringwood Realty Corporation (RRC), a subsidiary of the Ford Motor Company, purchased over 800 acres of land in the Borough of Ringwood, including the Site. From late 1967 until mid-1971, RRC disposed of waste materials at PMP, OCDA, and CMP, in accordance with State and local approvals. In 1970, RRC began transferring portions of the Site to the Borough and others. In 1973, the remaining property owned by RRC was donated to the State of New Jersey. Random dumping of waste materials by others occurred before, during, and after the 4-year period that Ford related wastes were disposed of at the Site.

The Site was placed on the Superfund National Priorities List (NPL) in 1983. Between 1984 and 1988, Ford, with USEPA oversight, conducted a Remedial Investigation there, followed by a Feasibility Study (FS), and remedial action including removal actions. Following this work, USEPA removed the Site from the NPL in 1994, based on a finding that cleanup actions were complete. However, in 1995, 1998, and 2004, additional areas of paint waste were identified at the Site, prompting further cleanup actions (e.g., drum and paint waste removal in the OCDA). The USEPA restored the Site to the NPL in 2006, and additional remediation activities consisting of additional Remedial Investigation (RI), sludge removal actions, risk assessment, additional FS activities, and remedial design were conducted. These activities are currently ongoing for OU-

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2's PMP Area, CMP Area, and OCDA. In addition, supplemental RI, FS and continued monitoring is being conducted for OU-3, Site-Related Groundwater.

From a historical and archaeological perspective, the history of mining, landfilling, and environmental remediation suggests that there is a low likelihood that substantial and potentially significant archaeological resources related to mining, or to earlier Native American activities remain at any of these areas. Lenik (1999) summarizes the preservation patterns for the industrial archaeology of mining operations of the Ramapo region as follows: "[A discontinuous cycle of prospecting, excavation of iron ore, cessation, and reopening] resulted in the physical alteration or destruction of early mining components at each site. Previously-existing structural features were often reworked or partially destroyed…. Reopening [or repurposing] the mines resulted in the development of new structures and features" and the partial or complete obliteration of earlier ones.

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V. Inventoried Historic Resources in 1-Mile Study Area

An archaeological site and historic properties file review was completed at HPO and NJSM for the New Jersey portion of the study area, and it was completed online using NY-CRIS for the New York portion. The purpose of this file review was to provide due-diligence confirmation no inventoried archaeological or historical properties occur within the APE. The area considered was a 1-mile buffer around the three Land ACs comprising OU-2, a typical review area for the type and extent activities planned for OU-2. This review found that there are no recorded archaeological sites at or in the immediate vicinity of the three Land ACs.

The nearest sites are situated in the HPO's half-mile archaeological sensitivity grid squares 0.2 to 0.6 mile east, southeast, and southwest of the CMP Area and 0.6 to 1.2 miles or more from the PMP/OCDA area (Figure 3). All inventoried sites date to the nineteenth or twentieth centuries; none are prehistoric Native American sites. Of the seven inventoried archaeological sites noted in the review of NJSM records, HPO has to date evaluated five for eligibility to the National Register of Historic Places (NRHP). Of the five evaluated sites, HPO has determined that four sites are ineligible for the NRHP, and one site is eligible (Table 2). No archaeological sites inventoried to date within the 1-mile study area are listed on the NRHP.

The 1-mile study area contains four inventoried historic resources (Table 3), none of which is directly related to the Peters or Cannon mining operations. These are the Ringwood Manor National Historic Landmark, a large parcel of land situated a minimum of 0.2 mile east of OCDA, the NRHP-eligible Ringwood Municipal Building, located approximately 0.5 mile east of the CMP Area, and Wanaque Reservoir, a contributing element to the NRHP-eligible Wanaque Reservoir Historic District, an arm of which reaches into the southern edge of the 1-mile study area (Figure 3). There are no inventoried archaeological sites or historic resources in the small, New York State portion of the 1-mile study area.

New Jersey HPO files include several cultural resource studies that have been completed within the 1-mile study area. These studies include Rutsch (1984) and Mary Delany Krugman Associates (2001). Of particular relevance to the present review is Lenik and Morrell (1984), which reviewed a large tract along Whaleback Mountain that included both the Peters and Cannon Mine areas. Although noting the possible presence of archaeological features of interest in the Peters Mine area, Lenik and Morrell (1984:35) concluded that "the majority of [their] study area has very low potential for containing cultural resources… Even [in the vicinity of Peters Mine] the potential is not great, since much of the area has been extensively altered."

Table 2: Inventoried Archaeological Sites within the 1-mile study

Site	Description	HPO Archaeological Sensitivity Grid Sq.*	Eligibility Status
28-PA-140	19th century rural industrial site	EB 35	Eligible
28-PA-192	Historic abandoned railroad grade	EE 34	Not Evaluated
28-PA-199	Mid 19th - mid 20th century foundation	EC 35	Not Evaluated
28-PA-204	Mid 19th - mid 20th century foundation	EE 34	Not Eligible
28-PA-208	Mid 19th - mid 20th century road trace	EE 34	Not Eligible
28-PA-209	Mid 19th - mid 20th century railroad grade	EE 34	Not Eligible
28-PA-210	Mid 19th - mid 20th century railroad ditch	EE 34	Not Eligible

Source: NJSM site files, January 2017

*Specific site locations recorded by the New Jersey and New York SHPOs are confidential and are not to be disclosed in public documents.

Table 3: Inventoried Architectural Properties within the 1-mile Study Area

Property Name (HPO ID and Other Identifiers*)	Location	Type of Property	Date Range	USGS Quadrangle	Eligibility Status (HPO Determination)
Ringwood Manor (HPO No. 2605 / NRIS No. 66000471)	1304 Sloatsburg Rd. Ringwood, NJ	Building	1739, 1764, 1771, 1807, 1853-1887	Greenwood Lake, NY-NJ	Listed (11/13/1966)
Ringwood Municipal Building (HPO No. 2404)	60 Margaret King Rd. Ringwood, NJ	Building	Early 20th century, circa 1920s	Greenwood Lake, NY-NJ	Eligible
Wanaque Reservoir Historic District (HPO No. 4844)	Ringwood and Wanaque Boroughs	Historic District	Early 20th century, circa 1920s	Wanaque, NJ	Eligible
Wanaque Reservoir (HPO No. 4844.028)	Ringwood and Wanaque Boroughs	Reservoir	Early 20th century, circa 1920s	Wanaque, NJ	Eligible as a contributing element of the Wanaque Reservoir Historic District

Sources: NJ HPO files, January 2017, and NY-CRIS, January 2017.

Key: NRIS—National Register Information System

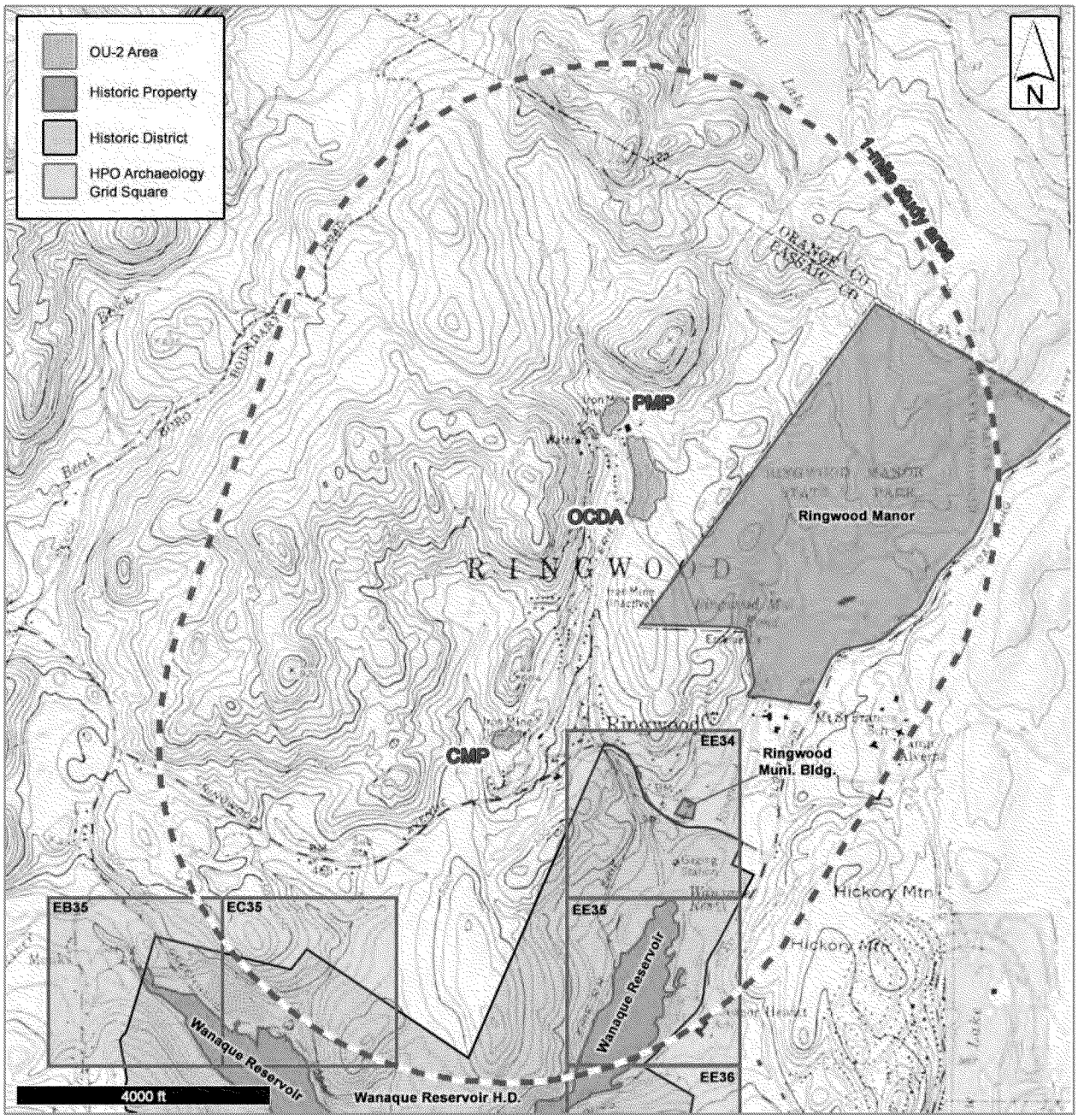

Figure 4: Inventoried Historic Resources in 1-Mile Study Area

VI. Field Inspection

Christopher L. Borstel, Ph.D., RPA, a Secretary of Interior-qualified archaeologist with experience at iron bloomeries and smithies in Vermont, conducted a field inspection of the three Land ACs on January 16, 2017. Dr. Borstel was accompanied on this visit by John Giuliano of Cornerstone, who served as a guide. Dr. Borstel made the following observations of the three areas.

PMP Area: This area surrounds the PMP pond and is partially wooded and partially covered by thick shrubs and young trees (Photos 1 to 5). There is a ventilation, or air, shaft outside the fenced area on the east side of a gravel road that curves to the left (facing the pit) from the staging area at the southern end of the PMP Area. This structure is outside the remediation and restoration areas. The gravel road curves around the pit, then extends northwest out of the area of interest. The road marks the approximate northerly and easterly limit of planned vegetation restoration at this locality. Southwest of the pit on the hillside outside of the PMP remediation and restoration area is an extensive set of cast-in-place concrete structures (framing for structures) that are the remnants of the 1942-1943 rehabilitation of Peters Mine. Inside the fence line, the ground slopes generally inward toward the center of the area, where the PMP pond is located.

The surface in the immediate vicinity of the PMP is hummocky from a combination of landfill debris (e.g., tires, metal, occasional masonry, bottle glass, upholstery, etc.) and rocks or rock piles. The hummocky terrain is chaotic and lacked any evident patterning. Remediation activities have previously taken place in the PMP Area, as evidenced by, among other observations, several strips of disturbed, partially revegetated land. Three partial or complete cast-in-place concrete foundations were observed. Two partial or complete foundation slabs were along the southeastern perimeter of the fenced area, while the third (only partially preserved) was situated near the western fence line at the base of the hillslope below the main 1940s-era concrete ruins. No structural elements remained above any of the foundations. Mapping by Edward Lenik (1999: Figure 25) indicates that the buildings in this area were secondary structures of limited importance to mining operations. Field observations and examination of aerial photographs from the 1960s and 1970s lead to a similar interpretation.

The main staging area for remediation activities in the vicinity is an open area located at the end of the paved part of Peters Mine Road. The staging area is relatively flat and appears to have been heavily utilized or graded over a considerable period of time. No standing ruins or foundations were observed within this part of the PMP Area.

OCDA: This area almost immediately adjoins the PMP Area on the southeast, and like it consists of a mix of shrubs, woods, and open patches of ground (Photos 6 to 9). While Peters Mine was in operation, this area was used as a sluice pond to dewater and deposit mine tailings. The ground slopes eastward from Peters Mine Road toward a stream and wetlands area that mark the eastern edge of the land AC. As at the PMP Area, many areas of ground are hummocky, and there is a combination of rock piles, likely mine tailings, and debris in piles and scattered across the surface, such as tires and metal. The western and central parts of this land AC are mostly upland woods—predominantly pole-size trees (implying no more than a few decades of growth), while the eastern portion is lower and a mix of open tall reeds and grasses and wooded wetland. One area near the southern end of the land AC, covering approximately 75 by 250 feet, was clearly visible as a location where prior excavations for remediation had taken place. Such excavations and those related to trenching for evaluation of soil characteristics occur in many parts of the OCDA. The OCDA contains no building remnants.

CMP Area: This area is situated approximately 1 mile south of the PMP and OCDA Areas. As a result of previous remediation activities, it is almost entirely open (Photos 10 to 13). Approximately 300 to 450 feet east of the location of the planned location of the CMP Area remediation and restoration activities, at the intersection of Van Dunk Lane and Milligan Lane, there is a fenced mine shaft, which was part of Cannon

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Mine. New fencing had been recently installed around it. The CMP Area is accessed by an approximately 600-foot gravel access road in good repair that runs from the end of Horse Shoe Bend Road to the CMP Area. The area where remediation and restoration will take place is on a ridge spur overlooking a small stream. No trees were present within the fenced CMP Area, and examination of aerial photographs indicated that trees were removed from the entire area for remediation investigations that were conducted at CMP between approximately 2007 and 2009. The surface of the CMP Area gently slopes to the northwest— i.e., toward the edge of the valley overlooked by this land AC. The evenness of the slope and lack of any surface debris or topographic irregularities other than one or two piles of very large boulders indicates the area was extensively graded. The rock piles were not mine tailing remnants but were probably imported to the location for landscaping or access management. One fenced area at the eastern end of the CMP Area is a subsurface void, but owing to thick vegetation within and around the fence, it was difficult to get a clear view of the feature. Otherwise, the CMP Area contains no aboveground ruins or foundations on the surface, and judging by the evidence of previous remediation activities and grading, it is unlikely that archaeological traces of any such features have been preserved.

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Photograph 1. PMP Area--Looking northwest from the end of the pavement on Peters Mine Road. The open area in the foreground is the staging area where vegetation will be stored, and the fenced area behind it is mine pit area where remediation and construction of a fill cap will occur. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 2. PMP Area—Typical landscape of terrain in remediation area. Looking northeast. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 3. PMP Area—Flooded mine pit in middle of remediation area. Looking south. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 4. PMP Area—Poured concrete building foundation near the southeastern edge of the remediation area. The foundation was built as part of the U.S. government rehabilitation of Peters Mine during the Second World War. Looking southwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 5. PMP Area—View from southwestern side of remediation area toward ruins of Peters Mine aboveground building complex on hillslope above mine pit. These ruins are the remains of the U.S. government rehabilitation of Peters Mine during the Second World War and are outside the remediation area. Looking southwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 6. OCDA—Chain link fence along Peters Mine Road marking western edge of the remediation area. PMP Area is at far left in distance. Hope Mountain is in background to right. Looking north. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 7. OCDA—Wooded wetland outside northeastern edge of area, looking toward OCDA. Looking southwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 8. OCDA—Typical hummocky terrain and thick vegetation in the central part of the area. Note refuse on the surface. Looking northwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 9. OCDA—Typical sloping terrain and thick vegetation in the southern part of the area. Note surface-exposed angular boulders, some or all of which may be mine tailings, and the metal refuse on the surface. Looking northwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 10. CMP Area—View from vicinity of remediation area along existing gravel access road that connects to the end of Horseshoe Bend Road to the area. Looking south. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 11. CMP Area—View from southern edge across area. Looking north. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

Photograph 12. CMP Area—Non-structural pile of boulders at western end of area. Looking northwest. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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Photograph 13. CMP Area—Typical terrain and vegetation of eastern part of area looking toward Van Dunk Lane. Looking northeast. Photo by C.L. Borstel, Tetra Tech, Inc., January 16, 2017.

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VII. Conclusions and Recommendations

This study has examined local history, reviewed agency information on inventoried archaeological sites and historic properties within 1 mile of the proposed activities, and conducted a field reconnaissance at the three Land ACs of OU-2. Based on this research, it is concluded that the Land ACs of OU-2 have low potential to contain any significant pre-contact period Native American or historic period archaeological resources. All three areas have been substantially altered over time due to historic use as iron mines, waste disposal, and ground-disturbing activities during previous remediation actions.

The study found that terrain of the CMP Area appears to have been extensively altered through filling and grading of surface features with refuse and soil to the prevailing grade outside the mine pit. The terrain of the OCDA is a mix of non-significant (and probably displaced) waste rock tailings from Peters Mine, landfill debris, and ground disturbances resulting from previous investigation and remediation episodes. The situation at the PMP Area is slightly more complex, but the conclusion is the same. The portion of this area within the LOD was originally excavated by multiple episodes of mining between the mid-eighteenth and early twentieth centuries. The ground surface of the LOD is characterized by hummocky ground, resulting from several years of use as a landfill, sloping to an open pond, which is the remnant of the mine pit that was subsequently partially filled with landfill debris. When waste disposal activities ceased in the early 1970s, aerial photographs indicate the fill in the mine pit was at grade with the adjoining terrain. Subsequent settling of the fill within the pit was principally responsible for the present topography and allowed water to accumulate as a shallow pond in the center of the pit. Some areas of ground disturbance within the fill also resulted from remediation activities at PMP. Three concrete building slabs and foundations were observed within the remediation area during the field inspection. These features were built during the final, very extensive rehabilitation of Peters Mine during the Second World War. Since virtually no mining took place after this rehabilitation, these elements can be regarded as comprising alterations that post-date the period of significance of the facility. In addition, the buildings were of secondary importance to the planned mining operations and preserve little historically significant information. Their loss through either demolition or burial would not substantially diminish whatever historical significance and integrity the main group of 1940s- era mining structures on the hillside above the mine pit might have.

It is therefore concluded that the proposed work within the three Land ACs comprising OU-2 will result in no effect to historical resources. It is recommended that the proposed remediation and restoration activities may proceed as planned, without further cultural resources study or documentation.

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Appendix A. Project Correspondence

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March 2, 2017

Via Electronic Mail

Joseph A. Gowers
Remedial Project Manager
Emergency and Remedial Response Division
USEPA Region II
290 Broadway, 19th Floor
New York, New York 10007-1866

Subject: Phase IA Cultural Resources Review
Ringwood Mines / Landfill Superfund Site
OU-2 Remedial Design
EPA ID No. NJD980529739

Dear Mr. Gowers:

Enclosed is a completed Phase IA cultural resources review of Operable Unit No. 2 (OU-2) of the Ringwood Mines / Landfill Superfund Site. The purpose of this study was to evaluate whether the three land areas of concern (AC); Peters Mine Pit (PMP), O'Connor Disposal Area (OCDA), and Cannon Mine Pit (CMP), comprising OU-2 might contain archaeological or historical resources that could be affected by planned remediation and restoration activities.

The study involved a cultural resources file search covering a 1-mile radius study area around the three land ACs, at the New Jersey Historic Preservation Office and the New Jersey State Museum, as well as an online search for pertinent information in the New York Cultural Resources Information System. In addition, background history was reviewed to understand the development of mining in the Ringwood area and a field inspection was completed.

Based on information developed during this review, the report concludes that the proposed activities for completion of the OU-2 remediation will result in no historic properties affected. The report also recommends that the proposed remediation and restoration activities proceed as currently planned without additional cultural resource studies. The accompanying attachments provide documentation that supports this conclusion and recommendation.

cornerstone
A TETRA TECH COMPANY

Please contact us if you have questions or comments on the enclosed report.

Sincerely,

Cornerstone Engineering Group, LLC

Gary J. DiPippo
Professional Engineer
NJ License No. 24GE02646100

Enclosure: Attachment A – Report
Attachment B – Figures
Attachment C - Photolog

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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

April 7, 2017

Steve Ferreira
Regional Historic Preservation Officer
Environmental Review Section
United States Environmental Protection Agency
Region 2
290 Broadway
New York, New York 10007-1866

Dear Mr. Ferreira:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published in the *Federal Register* on December 12, 2000 (65 FR 77725-77739) and amended on July 6, 2004 (69 FR 40544-40555), I am providing continuing Consultation Comments for the following proposed undertaking:

Passaic County, Ringwood Borough
Phase IA Archaeological Investigation
Ringwood Mines Landfill Superfund Site
United States Environmental Protection Agency

800.4 Identification of Historic Properties

Thank you for providing the Historic Preservation Office (HPO) the opportunity to review and comment on the following Phase IA cultural resources survey report, received at this office on March 9, 2017, for the above-referenced undertaking:

Borstel, Christopher L. Evan Robinson, and Gail Hellman

2017 *Phase IA Background Review and Archaeological Assessment, Ringwood Mines/Landfill Superfund Site Operable Unity 2, Borough of Ringwood, Passaic County, New Jersey.* Prepared for Cornerstone Engineering, Middletown, New York. Prepared by Tetra Tech, Inc. Parsippany, New Jersey.

According to the above-referenced report, the proposed remediation site is situated within the location of the former Ringwood iron mines, which saw numerous episodes of iron mining over a period of approximately 200 years. Based on the research conducted as part of this study, the report concludes that the proposed remediation has a low potential to affect Native American or historic-period archaeological historic properties. According to the report, the investigations found that the terrain of the proposed area of potential effects (APE) appears to have been extensively altered through filling and grading of surface features with refuse and soil to be the prevailing grade, outside of the mine pit. The terrain of the APE is a mix of non-significant waste rock tailings from Peters Mine, landfill debris, and ground disturbances resulting from previous environmental investigation and remediation episodes. The report concludes that the proposed remediation work within the APE will result in no effect to historic properties and that no further archaeological consideration is necessary. *The HPO concurs with this assessment.*

Additional Comments

Report Comments

The report, as submitted, is not in conformance with the Requirements for Archaeological Survey Reports – Standards for Report Sufficiency at N.J.A.C. 7:4-8.5. All work must be in accordance with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, 1983.* The following issues were noted with the submitted survey report:

1. Reports must be submitted as individual documents for accessioning in the Historic Preservation Office (HPO) contract and grant report reference library. This requires providing a copy printed on bond paper and bound in a hard-covered binder suitable for shelving. In addition, the report does not include the following:

    a. A Title Page
    b. A Management Summary
    c. A Table of Contents
    d. Figures, plates, and tables that are incorporated into the text on the page(s) following their citation, not appended.
    e. The report submitted does not include the qualifications of the authors who prepared the report. The report should include the qualifications of the Principal Investigator, in the form of a resume or curriculum vitae should be included as an appendix. Please submit a copy of the author's resume or curriculum vitae so that is can be appended to the report.

    Please address the above-referenced items and submit a hard copy of the revised report for accessioning.

2. The HPO requests that a copy of the final report be submitted in PDF format and be included on a CD.

Thank you for providing the opportunity to review and comment on the potential for the above-referenced project to affect historic properties. The HPO looks forward to receiving the results of

the above-referenced survey for review and comment. Please do not hesitate to contact Jesse West-Rosenthal of my staff at (609) 984-6019 with any questions regarding archaeology. Please reference the HPO project number 16-1695, in any future calls, emails, or written correspondence to help expedite your review and response.

Sincerely,

Katherine J. Marcopul

Katherine J. Marcopul
Deputy State Historic
Preservation Officer

Cc: Robin Madden-NJDEP, NHR
Ken Petrone-NJDEP, SRP

KJM/MMB/JWR

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Appendix B. Principal Investigator Resume

Experience Summary

Dr. Borstel has over 30 years of professional experience as an archeologist in academic, government, and corporate settings. He has worked throughout the northeastern United States, from Maine to Virginia, as well as on the U.S. High Plains and in Peru and China. Skilled in both prehistoric and historical archeology, Dr. Borstel's technical specializations include field archeology (survey and excavation), geoarcheology, lithic technology, and documentary research. He also has research experience in industrial archeology, architectural history, ethnography, and the socio-politics of heritage conservation. His responsibilities have included the development of archeological sensitivity assessments; design, supervision, and management of Phase I, II, and III cultural resource studies; preparation of technical documentation for National Historic Preservation Act (NHPA) Section 106 evaluations, National Register of Historic Places (NRHP) nominations, and environmental impact studies; and preparation of general-interest materials in archeology and history.

Education

Ph.D., Anthropology, Indiana University, 1993
M.S., Quaternary Studies, University of Maine at Orono, 1980
B.A., Anthropology, American University, 1976

Registrations/Certifications

Registered Professional Archaeologist (RPA), Earned January 1, 1997

Training

30-Hour OSHA Construction Safety Outreach Training; 2007
40-Hour OSHA Hazardous Waste Health and Safety (HAZWOPER) Training; 1995
8-Hour Annual Refresher for OSHA HAZWOPER Training; 2017
GPS Mapping with Trimble Asset Surveyor (update training seminar for Geo XT, 2006); 2001
Section 106 Regulations Workshop; 1999

Employment History

Tetra Tech, Inc., Morris Plains, NJ, Cultural Resources Specialist, 2005-present
Louis Berger Group, Inc., East Orange, NJ, Senior Archeologist, 1993-2005
Indiana University, Bloomington, IN, Doctoral Research (Anthropology), 1988-1993
Indiana University, Bloomington, IN, Associate Instructor (Anthropology), 1986-1988, 1989-1990
National Park Service, Boston, MA, Supervisory Archeologist, 1980-1985, 1986
American Indian Archeological Institute, Washington, CT, Assistant Crew Chief, 1979
University of Maine at Orono, Graduate Research (Quaternary Studies/Archeology), 1977-1980
University of Maine at Orono, Crew Chief, 1976-1977
Various employers and supervisors, Maryland, Virginia, Washington, D.C., Pennsylvania, New Mexico, and Colorado, Field Technician, Crew Lead, and related roles, 1970-1976

Selected Recent Project Experience

Principal Investigator, February 2016-present
Capital Power, Phase I Archaeological Survey of the Black Fork Wind Energy Project, Richland and Crawford Counties, OH
Supervising a Phase I archaeological study of a proposed 91-turbine, 200-megawatt wind energy project in north-central Ohio. The direct effects Area of Potential Effects (APE)/survey area covers approximately 600 acres, which is subject to a 100 percent survey. Developed the research design, oversaw field investigations, supervise report preparation, interface with client, etc.

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Archaeologist, March 2015-present
Equitrans / Mountain Valley Pipeline LLC., Phase IA Background Study, Mountain Valley Pipeline, Franklin, Giles, Montgomery, Pittsylvania, and Roanoke Counties, VA
Multiple assignments for archaeological studies of an approximately 300-mile natural gas pipeline in West Virgina and Virginia. Co-author and editor of a Phase IA archeological background study for the 98-mile Virginia portion of the pipeline. Conducted online research and reviewed archeological and historical census data, local and state histories, regulatory documents, gray and published cultural resources studies, and environmental data to enhance an existing study. Developed quality control procedures for digital tablet field data, completed report review of subcontractor study, contributed to cultural resources report that provides information for the Environmental Impact Statement prepared by the Federal Energy Regulatory Commission, and prepared artifact photographs for Phase I and II archaeological studies.

Principal Investigator, February 2015-present
EQT Corporation, Phase I Cultural Resources Studies, Equitrans Expansion Project, Allegheny, Greene, and Washington Counties, PA, and Wetzel County, WV
Desktop screening study, work plan development, and consultations with State Historic Preservation Offices (SHPOs) in two states for a natural gas pipeline expansion project involving up to 35 miles of new and replacement construction with multiple interconnections and compressor stations. Supervised archaeological field investigations, and co-authored project reports. Also served as editor / reviewer for architectural history survey of project and point of contact for consultations with state historic preservation offices.

Cultural Resources Team Lead, September 2013-present
New Jersey Department of Environmental Protection: Environmental Reviews for HUD Community Block Development Grants, Various Counties, NJ
Coordinate and conduct NHPA Section 106 historic preservation reviews of properties whose owners have applied for federal funding to repair damage from Superstorm Sandy (October-November 2012). Multiple task orders involving 15 to 65 properties apiece, with fast turnarounds. Desktop reviews involving application of evaluation criteria from a FEMA / NJ SHPO Programmatic Agreement and, as necessary, consultation with the SHPO on potential architectural and / or archeological issues identified at the property. To date have completed reviews of approximately 1,700 properties.

Cultural Resources Specialist, March 2013-October 2015
U.S. Department of Energy (DOE), Third-Party Environmental Impact Statement for the Proposed Clean Line Energy Partners Plains and Eastern HVDC Transmission Line, KS, TX, OK, AR, and TN
Responsible for developing the cultural resources section of the draft and final environmental impact statements (EIS) of a proposed 700-mile high voltage direct-current transmission line running from an extensive wind generation resource area in western Oklahoma and adjoining regions of Kansas and Texas to an interconnection in western Tennessee. Section was developed using materials provided by the project proponent, the client, and independently-conducted desktop research. Coordinated development of study with a nationwide, multidisciplinary, multi-firm team, the project proponent and their cultural resources contractor, and the staff of the client. Summarized existing information about cultural resources, assessed the potential for project impacts, considered indirect impacts and connected actions, and prepared extensive text and tables.

Archeologist, June 2013-January 2014
Excelerate Liquefaction Solutions I, LLC, and Lavaca Bay Pipeline System, LLC: Phase I Terrestrial Archeological Survey, Lavaca Bay LNG Project (Project) in Calhoun and Jackson Counties, TX
Project archeologist for Section 106 review by the Federal Energy Regulatory Administration (FERC) of a proposed 29-mile natural gas pipeline on the Central Gulf Coast of Texas. Conducted desktop analysis

of previous work and archeological sensitivity to develop archeological survey work plan. One round of fieldwork has been completed to date.

Cultural Resources Specialist, August-December 2013
Confidential Client, Critical Issues Analyses (CIAs) for Nationwide Survey of Potential Wind Energy Development Sites (AL, AR, CO, GA, IN, KS, MD, ME, MI, MN, MO, NC, ND, NE, NH, NY, OK, OR, PA, SD, TN, TX, VA, VT, WA, and WI)
Provided administrative support for cultural resources team responsible for reviewing over 60 potential wind energy generating facility sites in 26 states for potential fatal flaws. Project involved fast-tracked reviews of potential project sites, with average 30-day turnaround from assignment to delivery. Assisted cultural resources supervisor in: matching nationwide cultural resources staff from multiple divisions of company to individual project assignments; identifying state-specific online databases / GISs needed to complete reviews; and development of report template to ensure uniformity of effort and reporting.

Principal Investigator, December 2012-January 2013
Rochester Gas & Electric Co., Phase I Archeological Survey of Proposed Station 255 for the Rochester-Area Reliability, Town of Chili, Monroe County, New York
Conducted a Phase I archeological study of 43.7 acres of farmland proposed for development as an electrical substation. The survey involved Completed limited, property-specific background research and completed a field survey involving a combination of systematic surface survey and shovel testing on the floodplain of the Genesee River and on neighboring uplands. The survey identified one prehistoric period Native American site, which was evaluated as not eligible for the National Register of Historic Places. Prepared study report for review by the New York Office of Parks, Recreation and Historic Preservation pursuant to state law.

Cultural Resources Team Lead, October 2012-March 2014
Indeck Wharton, LLC., Indeck Wharton Energy Center Project, Danevang Vicinity, Wharton County, TX
Responsible for cultural resources component of site screening studies, Phase I archeological survey, and field architectural reconnaissance for a proposed natural gas-fired combustion turbine peaker plant on the central Gulf Coast Plain of Texas, approximately 70 miles southwest of Houston to address initial project planning needs and data requirements for Section 106 consultation by the US Environmental Protection Agency (EPA). Developed background information on 1.5-mile-radius study areas to evaluate five potential project sites in Brazoria, Grimes, Harris, Liberty, and Wharton Counties using information from the Texas Historical Commission and other sources, followed by detailed background research and preparation of a work plan for a Phase I cultural resources study at the selected project location. Conducted archeological fieldwork in an area of potential effects (APE) of approximately 160 acres and architectural field reconnaissance principally in a 0.5-mile-radius APE. Lead author for resulting study report.

Project Archeologist, May-September 2012
Corpus Christi Liquefaction, LLC, and Cheniere Corpus Christi Pipeline, L.P. (Cheniere Energy, Inc.): Supplementary Phase I Archeological Survey of Revised Project Segments for the Corpus Christi Liquefaction Project, San Patricio County, Texas
Conducted a Phase I field survey of 11 project segments along a 23-mile project alignment for a proposed FERC-licensed natural gas pipeline, liquefaction plant, and marine terminal, using systematic surface survey and shovel testing. Prepared study report for review by the Texas Historical Commission under Section 106 and handled distribution of accepted report to various repositories.

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Cultural Resources Specialist, June 2010-June 2011
CPV Ashley Renewable Energy Company, LLC: Ashley Wind Energy Project, McIntosh County, ND
Worked as archeologist, client's representative, and GPS operator for various cultural resources studies connected with the development of a proposed 200-MW wind project in southeastern North Dakota. Studies sought to address applicable federal and state regulations, including NHPA Section 106. Team member and field leader for several rounds of Class III archeological survey. Also provided field support to a traditional cultural properties survey conducted by a group of Native American stakeholders.

Cultural Resources Specialist, December 2010-January 2011
San Antonio Water System: Proposed Demolition of Historic Water Tanks, Former Kelly Air Force Base, Bexar County, TX
Combining online research, previous cultural resources studies, and client-supplied information, developed historic contexts for two large elevated water tanks constructed at former Kelly Air Force Base in 1943 and 1951 and evaluated potential regulatory issues connected with their proposed demolition by their present owner, the local water authority.

Archeology Field Director /Cultural Resource Specialist, August 2005-October 2010
U.S. Army Corps of Engineers—New York District: Investigation, Remedial Action, Demolition, and Restoration Project at Former Fort Slocum, Davids Island, New Rochelle, Westchester County, NY
Multiple assignments assisting client in meeting stipulations of a Memorandum of Understanding prepared under Section 106 of the NHPA to address effects of demolition of a 78-acre National Register-eligible historic district. Assignments included: (a) technical representative to periodic stakeholder meetings; (b) Phase I archeological survey of prehistoric and historic resources involving over 830 shovel tests, 34 machine trenches, and 18 test units and assessment of potential project effects, including analysis of stratigraphic patterns to develop a general geoarcheological model of historic landform alteration; (c) research and preparation of historic context of former US Army post; (d) preparation of individual HABS/HAER documentation for fortifications, monuments, and utilitarian structures and systems; (e) preparation of research design for historic landscape survey; (f) researcher/complier/editor for six-volume final HABS/HAER documentation of 90 historic buildings and structures; (g) principal author and content designer for 80-page website on history and architecture of Davids Island/Fort Slocum ("The Army's Century on Davids Island," http://davidsisland.westchesterarchives.com); and (h) designer and supervising compiler of final digital archive for project's cultural resources records, including over 6,000 project photographs, historical maps, photographs, and records, and other materials.

Publications & Presentations

Reeve, S.A., S.B. Marshall, J.C. Sexton, M.A. Carper, and C.L. Borstel. 2009. Assessing the Past to Secure the Future: Cultural Resources and Wind Energy. Poster presented at WINDPOWER 2009 Conference & Exhibition, sponsored by the American Wind Energy Association (AWEA), Chicago, IL, May 2009.

Borstel, C.L., V.R. Rolando, and B.M. DuPlantis. 2004. Initial Investigation of the East Middlebury Iron Works Site, Vermont. Paper presented to the Annual Meeting of the Middle Atlantic Archeological Conference, 2004.

Borstel, C.L., and R.M. Jacoby. 2001. Recent Excavations at the Fort Vengeance Monument. Talk presented at the Spring Meeting of the Vermont Archeological Society.

Borstel, C.L. 1999. From the Iron Age to the Electric Age: the Industrial Development of Rockydale, Bristol, Vermont. Paper presented to the Spring Meeting of the Vermont Archeological Society.

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Borstel, C.L. 1998. The Hinman-Kelly Sawmill Site: Exploring Vermont's Industrial Heritage. Poster presented at the Fall Meeting of the Vermont Archeological Society.

Borstel, C.L. 1996. A Gasoline Lighting System in Erie, Pennsylvania: A Rural Technology in an Urban Setting? Paper presented to the Annual Meeting of the Middle Atlantic Archeological Conference.

Borstel, C.L., M. Janowitz, and M. Gordon. 1995-1996. Archeology and History at the Erie Federal Courthouse Site. Exhibit presented at the Erie History Center, Erie County Historical Society.

Borstel, C.L. 1993. Powerful Landscapes: The Modern State and the Archeology of Complexity in China. Paper presented to the Annual Meeting of the American Anthropological Society, Washington, D.C.

Borstel, C.L. 1993. *Constructing Prehistory in the People's Republic of China: An Ethnography of State, Society, and Archeology*. Ph.D. dissertation, Indiana University. University Microfilms, Ann Arbor, Michigan.

Conrad, G.W., C.K. Borstel, and K.P. Jacobi. 1989 Analysis of Exposed Architecture at San Antonio: Foundation for an Excavation Strategy. In D. Rice and C. Stanish (eds.), pp. 371-394. *Ecology, Settlement, and History in the Osmore Drainage, Peru*. British Archeological Reports, International Series, vol. 545.

Conrad, G.W., C.L. Borstel, and K.P. Jacobi. 1987. San Antonio: Analysis of the Exposed Architecture at an Estaquina Phase Site, Moquegua. Paper presented to the Annual Meeting of the Society for American Archeology.

Borstel, C.L. 1986. *Data Collection at Coast Guard Beach (19BN374), Cape Cod National Seashore, Eastham, Massachusetts (Chapters in the Archeology of Cape Cod, V)*. Cultural Resources Management Study (Unnumbered). Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

Borstel, C.L. 1986. Review of Simmons and Simmons (eds.)—Old Light on Separate Ways: The Narragansett Diary of Joseph Fish, 1765-1776. *North American Archeologist* 7:89-92.

Borstel, C.L. 1986. Current Directions: An Introduction. In C.L. Borstel and L.A. Towle (eds.), pp. 1-5. *Current Directions in the Archeology of Cape Cod and the Islands*, a thematic issue of the *Bulletin of the Massachusetts Archeological Society* 47(1).

Borstel, C.L. 1986. Site Deposits and Contexts, Outer Cape Cod, Massachusetts. Poster presented to the Annual Meeting of the Society for American Archeology.

Borstel, C.L. 1985. *The 1983 Excavations at 19BN281 (Chapters in the Archeology of Cape Cod, II)*. Cultural Resources Management Study Number 12. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

Borstel, C.L. 1985. Booknote Review of Spiess and Hedden—Kidder Point and Sears Island in Prehistory. *American Antiquity* 50:933.

Borstel, C.L. 1985. Determining Shell Densities Using a Visual Estimation Technique. Paper presented to the Annual Meeting of the Society for American Archeology.

Borstel, C.L. (organizer and symposium chair) 1985. Current Research in Cape and Islands Prehistory. Presented to the Annual Meeting of the Northeastern Anthropological Association.

Borstel, C.L. 1985. Background to Cape and Islands Prehistory. Paper presented to the Annual Meeting of the Northeastern Anthropological Association.

Borstel, C.L., F.P. McManamon, J. Fitzgerald, A. Dwyer, A.E. Spiess, and M.E. Hancock. 1985. Changing Environments and Changing Subsistence at Nauset Marsh, Eastham, Massachusetts. Paper presented to the Annual Meeting of the Northeastern Anthropological Association.

Borstel, C.L. 1984. Stratigraphy and Archeological Context of Prehistoric Sites at Cape Cod National Seashore. In F.P. McManamon (ed.), vol. I, pp. 181-229. *Chapters in the Archeology of Cape Cod, I: Results of the Cape Cod National Seashore Archeological Survey, 1979-1981.* Cultural Resources Management Study Number 8. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

Borstel, C.L. 1984. Prehistoric Site Chronology: A Preliminary Report. In F.P. McManamon (ed.), vol. I, pp. 231-313. *Chapters in the Archeology of Cape Cod, I: Results of the Cape Cod National Seashore Archeological Survey, 1979-1981.* Cultural Resources Management Study Number 8. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

Borstel, C.L. 1984. Stones for Tool-Making: Local Resources and Archeological Observations. In F.P. McManamon (ed.), vol. II, pp. 277-337. *Chapters in the Archeology of Cape Cod, I: Results of the Cape Cod National Seashore Archeological Survey, 1979-1981.* Cultural Resources Management Study Number 8. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

McManamon, F.P. and C.L. Borstel. 1984. The Natural Environment and Natural Resources. In F.P. McManamon (ed.), vol. I, pp. 95-115. *Chapters in the Archeology of Cape Cod, I: Results of the Cape Cod National Seashore Archeological Survey, 1979-1981.* Cultural Resources Management Study Number 8. Division of Cultural Resources, North Atlantic Regional Office, National Park Service, Boston.

Borstel, C.L. 1984. The Eastern Archeological Field Laboratory: What It Is. Talk presented to the Semiannual (Spring) Meeting of the Massachusetts Archeological Society.

Borstel, C.L., J. Fitzgerald, and S.A. Chase. 1983. Big Surf and Killer Poison Ivy: Archeology at Coast Guard Beach, Cape Cod National Seashore. Paper presented to the Annual Meeting of the Eastern States Archeological Federation.

Borstel, C.L. 1982. *Archeological Investigations at the Young Site, Alton, Maine.* Occasional Publications in Maine Archeology Number 2. Maine Historic Preservation Commission, Augusta.

Borstel, C.L., and F.P. McManamon. 1981. Horizontal and Vertical Structures in Plow Disturbed Sites, Cape Cod National Seashore. Paper presented to the Annual Meeting of the Northeastern Anthropological Association.

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McManamon, F.P., and C.L. Borstel. 1981. Preliminary Analysis of Several Sites from Cape Cod National Seashore. Paper presented to the Annual Meeting of the Northeastern Anthropological Association.

Borstel, C.L. 1981. Column Sampling in Shell Middens: A Methods Study from Cape Cod. Paper presented to the Annual Meeting of the Northeastern Anthropological Association.

Borstel, C.L. 1978. Excavations at the Young Site. Talk presented to the Annual Meeting of the Maine Archeological Society.

Handsman, R.G., and C.L. Borstel. 1975. Archeological Cooperatives: The Need for Centralization? Paper presented Annual Meeting of the Society for Pennsylvania Archeology.

Recent Awards

Commander's Certificate of Appreciation, US Army Corps of Engineers, New York District, in recognition of outstanding dedication and lasting contribution to the Davids Island/Fort Slocum Restoration project, December 2008.

Tetra Tech EC, Inc., CSQ Star of the Month Award for contributions to development of Davids Island virtual exhibit website ("The Army's Century on Davids Island"), September 2009

Tetra Tech EC, Inc., Spot Bonus for outstanding performance in support of the Davids Island virtual exhibit website ("The Army's Century on Davids Island"), October 2009

Certificate of Appreciation, Fort Slocum Alumni & Friends, for contributions to the dissemination of the history of Fort Slocum, November 2009

Tetra Tech EC, Inc., Spot Bonus for outstanding performance during preparation of the fast-tracked Iron Star Wind Project (Ford County, KS) Critical Issues Analyses, September 2010

Greater Hudson Heritage Network, 2010 Award towards Excellence (co-recipient) in recognition of the collaborative effort to preserve, document, and make accessible the history of Davids Island through an innovative website, "The Army's Century on Davids Island," October 2010

Tetra Tech EC, Inc., Spot Bonus for outstanding performance for finishing a field reconnaissance and monitoring effort for the Osage Wind Project (Osage County, OK) well ahead of schedule, July 2011

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