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Environmental Assessment for the New Campus Loop Road and Utility Infrastructure Upgrades at the U.S. Department of Veterans Affairs Manchester Medical Center 718 Smith Road, Manchester, Hillsborough County, New Hampshire VA Project: 608-20-101

US Department of Veterans Affairs

Manchester VA Health Care System
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Table of Contents

1 INTRODUCTION 1
1.1 Manchester VAMC Description 1
1.2 Purpose and Need 1
1.3 Regulatory Basis for the Environmental Assessment 2
1.4 Decision-Making 2
2 DESCRIPTION OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE 3
2.1 Alternatives 3
2.1.1 Proposed Action 3
2.1.2 No Action Alternative 6
3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 7
3.1 Criteria for Analysis of Impacts 7
3.2 Environmental Resources Dismissed from Further Analysis 7
3.3 Environmental Resources Analyzed 9
3.3.1 Aesthetics 9
3.3.1.1 Existing Environment 9
3.3.1.2 Thresholds of Significance 9
3.3.1.3 Environmental Consequences 9
3.4 Air Quality 11
3.4.1 Existing Environment 11
3.4.2 Thresholds of Significance 13
3.4.3 Environmental Consequences 13
3.5 Cultural and Historical Resources 17
3.5.1 Existing Environment 17
3.5.2 Thresholds of Significance 19
3.5.3 Environmental Consequences 19
3.6 Geology, Topography, and Soils 20
3.6.1 Existing Environment 20
3.6.2 Thresholds of Significance 23
3.6.3 Environmental Consequences 23
3.7 Water Resources 25
3.7.1 Existing Environment 25
3.7.2 Thresholds of Significance 27
3.7.3 Environmental Consequences 27

3.8 Wildlife and Habitat 28
3.8.1 Regulatory Basis 28
3.8.2 Existing Environment 28
3.8.3 Thresholds of Significance 29
3.8.4 Environmental Consequences 29
3.9 Noise 29
3.9.1 Noise Receptors 30
3.9.2 Existing Environment 30
3.9.3 Thresholds of Significance 31
3.9.4 Environmental Consequences 31
3.10 Solid Waste and Hazardous Materials 32
3.10.1 Existing Environment 32
3.10.2 Thresholds of Significance 33
3.10.3 Environmental Consequences 33
3.11 Transportation and Parking 33
3.11.1 Existing Environment 33
3.11.2 Thresholds of Significance 34
3.11.3 Environmental Consequences 34
3.12 Utilities 35
3.12.1 Existing Environment 35
3.12.2 Thresholds of Significance 36
3.12.3 Environmental Consequences 36
3.13 Socioeconomics 38
3.13.1 Existing Environment 38
3.13.2 Thresholds of Significance 38
3.13.3 Environmental Consequences 38
3.14 Environmental Justice 39
3.14.1 Existing Environment 39
3.14.2 Thresholds of Significance 39
3.14.3 Environmental Consequences 39
4 Agency Coordination and Public Involvement 40
4.1 Early Input from Federal, State, and Local Agencies 40
4.2 Public Review 40
5 Environmental Management Measures 41

6 List of Preparers 45
7 References 46
8 Glossary 49

TABLES

Table 1. Environmental Resources Dismissed from Further Analysis 8
Table 2. National Ambient Air Quality Standards 12
Table 3. Estimate of Particulate Emissions during Construction of the Proposed Action 14
Table 4. Estimated Construction Equipment Use 14
Table 5. SCAB Fleet Average Emission Factors (Diesel) 14
Table 6. Total Criteria Pollutant Emissions from Construction Equipment 14
Table 7. On-Road Heavy-Duty Diesel Vehicle Estimates 15
Table 8. On-Road Heavy-Duty Diesel Vehicle Emissions 15
Table 9. Construction Worker - Emissions Factors for Light-Duty Gasoline-Fueled Vehicles ... 15
Table 10. Construction Worker - Emissions from Light-Duty Gasoline-Fueled Vehicles 15
Table 11. Total Emissions for the Proposed Action Construction Phase 16
Table 12. USDA-NRCS Soil Characteristics 23
Table 13. Common Household, Industrial, and Construction Sound Levels 30

FIGURES

Figure 1. Proposed Loop Road and Parking Lot Improvements 4
Figure 2. Proposed Action Privacy Design 10
Figure 3. USDA-NRCS Soil Map 21
Figure 4. Water Resources in Vicinity of the Manchester VAMC 26
Figure 5. FEMA Floodplain Map (floodplain boundary map 33011C0239D) 27
Figure 6. Manchester VAMC Entrances and Roadways 34

APPENDICES

Appendix A – Regulatory Communications

Appendix B – Public Involvement Documentation

Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AIRFA	American Indian Religious Freedom Act of 1987
AMSL	Above Mean Sea Level
APE	Area of Potential Effect
ARPA	Archaeological Resource Protection Act of 1979
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHP	Combined Heat and Power
CLC	Community Living Center
CO	Carbon Monoxide
CY	Cubic Yard
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GCR	General Conformity Rule
HUD	U.S. Department of Housing and Urban Development
lbs	Pounds
LED	Light-Emitting Diode
MARTA	Metropolitan Atlanta Rapid Transit Authority
MBTA	Migratory Bird Treaty Act
MTA	Manchester Transit Authority
$\mu g/m^3$	Micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NH	New Hampshire
NHCP	New Hampshire Coastal Program
NHDES	New Hampshire Department of Environmental Services
NHDHR	New Hampshire Division of Historical Resources
NHDOT	New Hampshire Department of Transportation
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conversation Service

NRHP	National Register of Historic Places
O_3	Ozone
OSHA	Occupational Safety and Health Administration
PM	Particulate Matter
PPB	Parts per Billion
PPM	Parts per Million
ROI	Region of Influence
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF	Square Foot
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TDAT	Tribal Directory Assessment Tool
THPO	Tribal Historic Preservation Officer
TPY	Tons per Year
US	United States
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
VA	US Department of Veterans Affairs
VAMC	Veterans Affairs Medical Center
VHA	Veterans Health Administration
VOC	Volatile Organic Compound
WHO	World Health Organization
WWII	World War II

1 INTRODUCTION

1.1 Manchester VAMC Description

The U.S. Department of Veterans Affairs (VA) Manchester Healthcare System provides medical services at five locations serving New Hampshire. Facilities include the Manchester VA Medical Center (Manchester VAMC) and four community-based outpatient clinics in Conway, Portsmouth, Somersworth, and Tilton. The Manchester VAMC is the only VA hospital in New Hampshire serving the state's approximately 90,000 Veteran residents. The Manchester VAMC campus, at 718 Smyth Road in Manchester, Hillsborough County, encompasses approximately 34.5 acres in the north central portion of the City of Manchester and is surrounded by residential neighborhoods with single family homes. The campus is bordered to the south by Smyth Road; to the east by residential properties on Hillhaven Road; to the north by residential properties on Patricia Lane; and to the west by residential properties on Holmes Drive.

The majority of the Manchester VAMC campus is populated by with medical buildings, parking lots, and supporting infrastructure. The campus is located on a hill that slopes steeply from the north to the south, with a topographic ridge sloping both east and west through the approximate center of the campus.

The original 8-story Manchester VAMC main building was built in 1948. The Smyth Tower, a 40-foot tall, 28-foot diameter fieldstone folly was built in 1888 and listed on the National Register of Historic Places in 1978.

1.2 Purpose and Need

One of the critical missions of VA is to provide healthcare to the nation's millions of Veterans. Construction projects are often required by VA to meet the changing demand for services, improve aging infrastructure, and to keep pace with ever-changing technology and models of care.

The Manchester VAMC campus was constructed in the late 1940s. Over the last 70 years, the property has become increasingly developed, resulting in a severed traffic flow through the campus and an increase in vehicular traffic at pedestrian crossings. As medical services have expanded, demand for parking has increased, placing a strain on existing parking capacity. The existing underground utility infrastructure for potable water is aging and has many inoperable valves. Further, the stormwater management system does not adequately capture and redirect stormwater away from abutting residential properties.

The ***purpose*** of the Proposed Action is to construct and operate a new loop road, parking and transportation improvements, safety enhancements, stormwater management improvements, and underground water utility infrastructure upgrades at the Manchester VA Medical Center.

The Proposed Action is ***needed*** to enable VA to address deficiencies related to vehicle circulation issues, pedestrian safety concerns, parking constraints, neighbor complaints about flooding and nuisance lighting, and water utility functions at the Manchester VAMC.

If the Proposed Action is not implemented, the new loop road, safety features, and additional parking spaces would not be constructed, causing the staff, patients, and visitors of the Manchester VAMC to continue to endure severed traffic flow, safety concerns, and limited parking capacity. Additionally, the water utility infrastructure would continue to degrade, and abutting residential properties would continue to endure nuisance lighting and flooding.

This EA was prepared in accordance with the National Environmental Policy Act of 1969 ([NEPA]; 42 United States Code [USC] 4321 et seq.), the President's Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and VA's NEPA implementing regulations, 38 CFR Part 26 (Environmental Effects of the U.S. Department of Veterans Affairs Actions).

1.3 Regulatory Basis for the Environmental Assessment

VA is required to conduct an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code 4321 *et seq*.), the White House Council on Environmental Quality (CEQ) "Regulations Implementing the Procedural Provisions of NEPA" (40 Code of Federal Regulations [CFR] 1500–1508), VA's NEPA regulations titled "Environmental Effects of the Department of Veterans Affairs Actions" (38 CFR Part 26), and VA's NEPA Interim Guidance for Projects (VA, 2010). These requirements specify that VA must evaluate the potential environmental impacts of VA facilities, operations, and related funding decisions prior to taking action.

VA utilizes the NEPA review process to make an informed decision prior to undertaking a Proposed Action. An EA provides sufficient evidence and analysis for determining whether an action would cause significant environmental impacts (requiring an Environmental Impact Statement [EIS]) or the agency can issue a finding of no significant impact (FONSI) (40 CFR 1508.9). VA decision makers review the EA and, if an EIS is not required, issue a Finding of No Significant Impact (FONSI). A FONSI is a decision document that briefly presents the reasons why an action would not have a significant effect on the human environment (40 CFR 1508.13). As required by NEPA and the implementing regulations from CEQ and VA, this EA also evaluates a No Action alternative to provide a baseline for comparison of potential impacts associated with the Proposed Action.

1.4 Decision-Making

VA has prepared this EA to identify, analyze, and document the potential physical, environmental, cultural, and socioeconomic impacts associated with implementing the construction and operational elements of the Proposed Action. Additionally, this EA evaluates the potential impacts associated with taking No Action.

VA, as a federal agency, is required to incorporate environmental considerations into its decision-making process for the actions it proposes to undertake. Therefore, this EA:

- Informs the public of the possible environmental impacts of the Proposed Action and its considered alternatives, as well as methods that would be used to mitigate these impacts;
- Provides for public, state, inter-agency, and tribal input into VA's planning and evaluation;
- Documents the NEPA process; and
- Supports informed decision-making by the federal government.

The decision to be made is whether—having considered the potential physical, environmental, cultural, and socioeconomic impacts—VA should implement the Proposed Action including, as appropriate, measures to reduce adverse impacts.

2 DESCRIPTION OF THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

2.1 Alternatives

NEPA regulations require that federal agencies evaluate reasonable alternatives for meeting the purpose of and need for action, including a no action alternative. Aside from the Proposed Action and the No Action alternative, no other reasonable alternatives meeting the purpose and need for action were identified.

2.1.1 Proposed Action

2.1.1.1 Loop Road, Parking Improvements, and Pedestrian Safety Improvements

Under the Proposed Action, VA would fund the construction of a new 2-way loop road that would total approximately 3,700-linear feet. It would allow for a more efficient and safe transit around the campus for patients, visitors, staff and delivery vehicles. The loop road would connect the two entrances creating a single roadway to all of the facilities. It would eliminate the primary pedestrian safety issue. The new parking lots would also prioritize pedestrian safety and would be consistent with VA's current design requirements.

A minimum of 135 new parking spaces would be created by implementing the following improvements:

- The existing unpaved parking lot in the southwest portion of the campus (near Hillhaven Road and Smyth Road) would be paved with asphalt.
- The existing parking lot west of the maintenance building would be replaced with a parking lot to the west of the loop road.
- The existing parking lot on the eastern portion of the campus would be expanded. The loop road would traverse the eastern side of the expanded parking lot to further improve pedestrian travel between the parking lot and the main medical building.
- In the northern portion of the campus where there is currently an approximately 3-acre wooded area that would be cleared, a new parking lot would be created north of the loop road, while a smaller parking lot would be created on the opposite southern side of the loop road. Two new parking lots would be created (one north and one south of the proposed loop road), and a third large parking lot would be created on the north end of campus on the north side of the proposed loop road.
- Curbing and sidewalks would be installed along the majority of the loop road to allow for safer travel throughout the campus by better separating pedestrian and vehicle traffic.

Figure 1. Proposed Loop Road and Parking Lot Improvements

2.1.1.2 Western Entrance Realignment

To increase the safety of vehicles entering and exiting the Manchester VAMC from the western entrance on Smyth Road, the entrance would be shifted approximately 50 feet to the west to align it with the Smyth Lane intersection to eliminate the need for unprotected left turns into and out of the campus.

2.1.1.3 Security Improvements

To comply with the VA Physical Design Manual for Mission Critical Facilities, additional pole-mounted security cameras would be installed throughout the campus, emergency call boxes with video surveillance would be installed near parking areas and along the loop road, and new vehicle barriers would be installed where necessary.

2.1.1.4 Aesthetic Improvements

To shield views into the Manchester VAMC and of the new loop road from the abutting residences on Hillhaven Road, VA would install a six-foot tall, 1,300-foot opaque vinyl fence and plant new shrubs and flowering deciduous trees on the western border of the campus starting at Smyth Road. Several of the large existing trees along the western border would be preserved.

To address complaints from residents about night-time glare from lighting fixtures at the Manchester VAMC, older outdoor lighting fixtures would be replaced with light-emitting diode (LED) lights and shielded to prevent them from shining directly at the residences. The lights would automatically dim to 30% of their normal lumen output after midnight.

2.1.1.5 Utility Upgrades

VA would replace all inoperable and degrading cast iron potable water lines, service lines, and fittings.

The majority of the campus drains to a low, naturally occurring infiltration basin near the intersection of Smyth Road and Holmes Drive on the eastern side of the campus. This basin discharges stormwater into an unnamed stream located along the eastern border of the campus. The stream flows into a subsurface culvert that eventually discharges into Goldfish Pond.

Significant stormwater management systems improvements would be implemented to address inefficiencies and abutting resident complaints about flooding. To infiltrate stormwater runoff from the 95th percentile of storm events in the Manchester, NH area, and to comply with Section 438 of the Energy Independence and Security Act (EISA 438), stormwater runoff from the majority of the loop road would be collected by an extension of the existing stormwater management system, then captured and infiltrated on site. A new underground retention and soil infiltration system would be used to manage stormwater runoff from the newly paved parking lot near the intersection of Smyth Road and Hillhaven Road and from the realigned parking lot near the maintenance building.

If 95th percentile storm events are exceeded, the excess runoff would be conveyed into a new pipe that would connect to an existing (but unused) municipal stormwater pipe extension located within an easement between the northeastern portion of the campus and Patricia Lane. Prior to making this new connection, the municipal stormwater pipe extension would be inspected and made functional. This stormwater would then flow directly into the City of Manchester stormwater sewer system.

Additionally, for storm events larger than the 95th percentile, stormwater runoff from the Smyth Road/Hillhaven Drive parking lot (located in the southwest portion of the campus) would flow toward Smyth Road as it currently does but would first flow through a detention basin quipped with a level spreader to minimize the discharged stormwater flow rate.

2.1.1.6 Construction Phasing

The construction phase is anticipated to take 16 months. This is required to start after the scheduled demolition of outbuildings D2, 3, 4, 5, 13, and 14 as stipulated in the MOA between VA and the SHPO. VA would implement the mitigation measures stated in the MOA prior to the demolition of the outbuildings.

Prior to and during the Proposed Action, VA would implement all the necessary protections for the utilities throughout the campus (including any pipes that might have been under the demolished buildings). Extensive coordination with utility service providers would be initiated.

During the Proposed Action, the A/E of Record would monitor existing water utility piping while new piping is constructed and completed. Disruptions to operations on campus would be avoided and mitigated which may require implementation of temporary procedures to ensure continuity of operations, possibly with redundant loops.

Where subsurface ledge is required to be removed using mechanical hammering, the construction contractor would minimize noise impacts to hospital and residential receptors by working during normal weekday business hours and using sound shielding devices, as needed.

Once these preparatory phases area completed, the new utility infrastructure would be installed; the grounds for the loop road and parking areas would be graded; the areas would be paved; and

new vegetation would be planted. During this phase, other improvements including installation of the vinyl fence, new lighting, and security features would occur.

Following construction, the existing VA staff would maintain the loop road, upgraded utilities, and other new improvements; no increase in staffing is anticipated to operate and maintain these new features.

2.1.2 No Action Alternative

Under the No Action alternative, the Proposed Action would not be implemented. The current deficiencies related to vehicle circulation, pedestrian safety, and stormwater and potable water utility infrastructure at the Manchester VAMC would not be addressed. Thus, the No Action Alternative would not meet the purpose and need for action.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents a detailed analysis of potential impacts to the human environment anticipated from implementing the Proposed Action or the No Action alternative. The analysis for each resource includes a description of the existing conditions, applicable regulatory requirements associated with implementing the Proposed Action, and any resource-specific management measures necessary to minimize any potential adverse impacts.

For the purposes of this EA, the Proposed Action site is the approximately 34.5-acre area Manchester VAMC campus. Although the limits of disturbance would only occur within an approximately 12-acre area within the site, the analyses presented in this EA consider the entire campus and the immediately surrounding region because the Proposed Action would impact these areas.

A broader "Region of Influence" (ROI) is analyzed for selected topics, such as air quality and noise, where impacts may occur beyond the Proposed Action site. This EA also considers the impacts of the Proposed Action in relation to the City of Manchester's 2021 Master Plan (*Manchester Master Plan*, 2021).

3.1 Criteria for Analysis of Impacts

The specific criteria for evaluating the potential environmental impacts of the Proposed Action and the No Action alternative are described in the following sections. The significance of an action is also measured in terms of its context and intensity. The context and intensity of potential environmental impacts are described in terms of duration, magnitude, and whether they are adverse or beneficial, as summarized here:

- **Short-term or long-term.** In general, short-term impacts are those that would occur only with respect to a particular activity, for a finite period, or only during the time required for construction or installation activities. Long-term impacts are those that are more likely to be persistent and chronic. Impacts must also be reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives.
- **Less-than-significant (negligible, minor, moderate) or significant.** These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts are generally those that might be perceptible but are at the lowest level of detection. A minor impact is slight, but detectable. A moderate impact is readily apparent. Significant impacts are those that, in their context and due to their magnitude, have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR Part 1508.27) and, thus, warrant heightened attention and examination for potential means of mitigation (if adverse) to fulfill the policies set forth in NEPA.
- **Adverse or beneficial.** An adverse impact is one having unfavorable or undesirable outcomes on the human-made or natural environment. A beneficial impact is one having positive outcomes on the human-made or natural environment.

3.2 Environmental Resources Dismissed from Further Analysis

The potential impacts of the Proposed Action and the No Action Alternative on the following environmental resources were analyzed but were determined to be none to negligible at even a localized level. Table 1 provides a summary of the environmental resources dismissed from further detailed analysis.

Table 1. Environmental Resources Dismissed from Further Analysis

Environmental Resource Dismissed	Rationale
Wetlands	The Proposed Action site was assessed via a site visit and the USFWS National Wetlands Inventory online database. The results indicated that there are no wetlands, vernal pools (protected under the Natural Resources Protection Act), marshes, or surface waters present within the limits of disturbance. The nearest surface water body is a riverine area in the southeastern portion of the Manchester VAMC property. This riverine area currently receives Manchester VAMC stormwater runoff, as regulated under the Manchester VAMC's MS4 permit. However, there would be no net increase of stormwater discharge to the stream or the southeastern portion of the Manchester VAMC under the Proposed Action. Therefore, the Proposed Action has no mechanism to adversely impact this riverine area. The nearest construction activities would occur approximately 230 feet west of this area.
Coastal Zone Management	According to Section 307 of the Coastal Zone Management Act (CZMA), federal actions with reasonably foreseeable coastal effects are subject to the federal consistency no matter where they occur within or outside of the state's coastal zones. The Manchester VAMC is located outside of the New Hampshire Coastal Program (NHCP) coastal zone boundary, and the Proposed Action has no mechanisms to reasonably impact coastal zone resources. Thus, pursuant to 15 CFR §930.33(a)(2), VA has determined that the Proposed Action would have no effects on any coastal use or resource, a negative determination under 15 CFR §930.35 would not be required, and further coordination with the NHCP under Section 307 of the CZMA would not be required.
Land Use and Zoning	The Proposed Action is consistent with the intended federal use of the property. The Proposed Action is not subject to the City of Manchester Land Use and Zoning regulations and would not cause or induce changes in land use or zoning to properties adjacent to or in the vicinity of the Manchester VAMC.
Community Services	Community services provided by Hillsborough County and the City of Manchester include police and fire protection, ambulatory services, schools, private health care, and parks and recreation. The Proposed Action would not place any additional burden on these services.

3.3 Environmental Resources Analyzed

Resource areas that are evaluated in further detail in this EA include: aesthetics; air quality; cultural resources; geology, topography, and soils; hydrology and water quality; wildlife and habitat; noise; floodplains; socioeconomics; solid waste and hazardous materials; transportation and parking; utilities; and environmental justice.

3.3.1 Aesthetics

Aesthetics refers to the visual resources, including natural and human-made features that give a particular piece of land its aesthetic properties. A combination of natural and built features influence and contribute to the aesthetic environment of an area. Natural features may include topography and vegetation, which may have been altered over time by human action, while built features can include buildings and other constructed elements. Beneficial or adverse impacts may occur depending on how changes to the existing aesthetic environment are perceived by human receptors, which can include visitors and residents living adjacent to and in the vicinity of the area.

3.3.1.1 Existing Environment

Of the approximately 34.5-acre Manchester VAMC property, approximately 18.5 acres have been developed. Development includes the main medical building, Community Living Center (CLC), Ambulatory Care building, Combined Heat and Power (CHP) plant that is located within the Boiler Building 7, engineering building, maintenance building, Smyth Tower, a former communication tower, and supporting infrastructure including roads and parking lots. Vegetative buffers are present between the developed areas and residential properties bordering the Manchester VAMC. Thus, the visual appearance of the Proposed Action site is of a highly developed VA medical center.

The area surrounding the Manchester VAMC is dominated by residential housing and bordering roads. The Manchester VAMC is partially visible to vehicles traveling on Smyth Road and Hillhaven Road. Smyth Road is located along the southern boundary of the Manchester VAMC, and Hillhaven Road is located along the western border. Residents on Hillhaven Road can see the the western portion of the campus. Residents on Smyth Road are able to see the developments on the southern portion of the campus. Residents bordering the northern and eastern portion of the campus are buffered by a wooded area.

The wooded buffer along the Manchester VAMC eastern and northern borders generally restricts views in and out of the majority of the campus, with the exception of the southern boundary. This boundary is not buffered and can be viewed from Smyth Road.

3.3.1.2 Thresholds of Significance

The Proposed Action would be considered to have a significant impact on aesthetics if: long-term alteration of the viewscape would occur that would require mitigation; negative alterations to the viewscape of a historical resource would be expected; or it was not in compliance with the overall viewscape of adjacent areas.

3.3.1.3 Environmental Consequences

3.3.1.3.1 Proposed Action

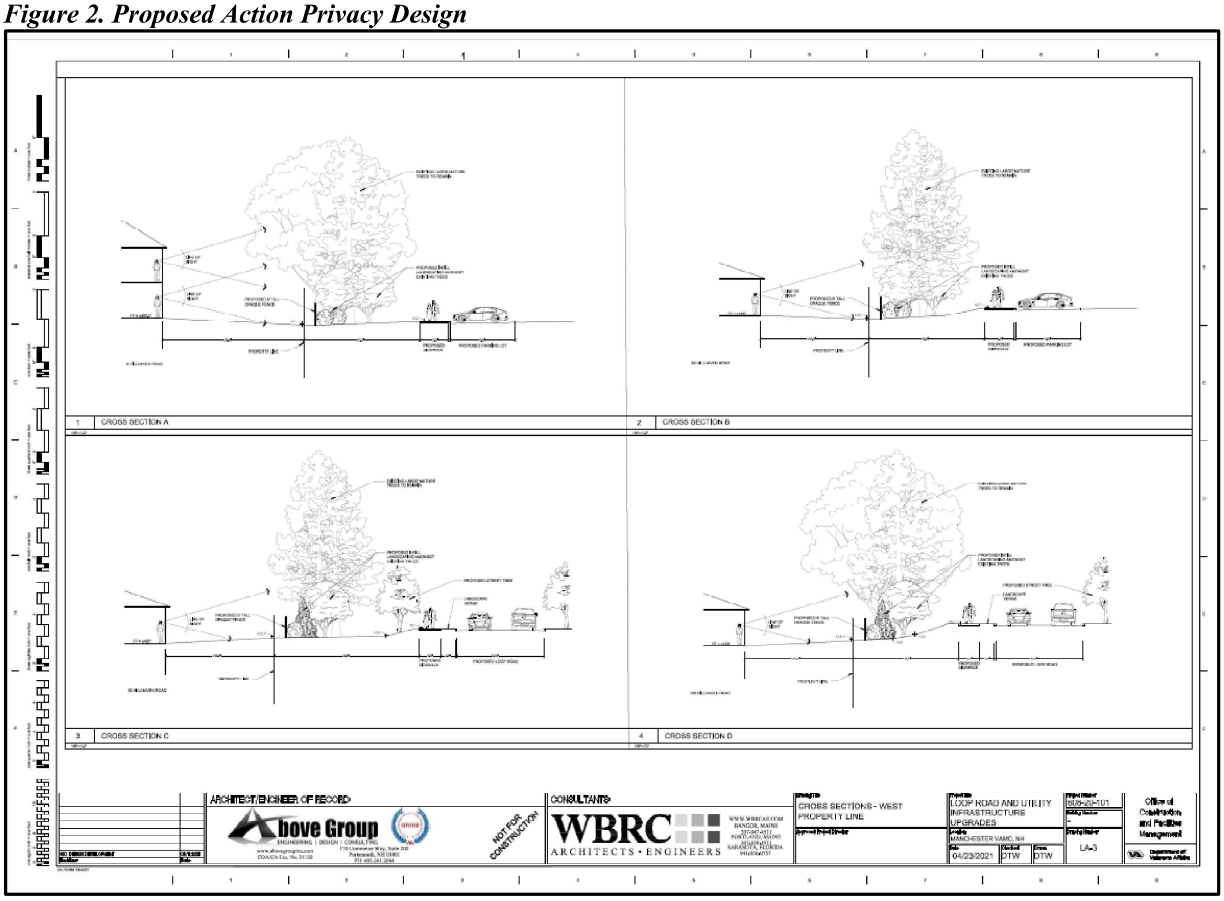
During the construction phase of the Proposed Action, construction equipment would be present throughout the Manchester VAMC and likely staged in the existing campus parking lots for up to 16 months. The temporary presence of heavy equipment and unfinished stages of construction would impact the current Manchester VAMC viewscape.

Prior to completion of the Proposed Action design documents, VA conducted two public meetings in 2021 to inform the abutting neighbors of the Proposed Action and to provide an opportunity to discuss questions or concerns. During these meetings, three main concerns were raised:

- current stormwater runoff and flooding issues;
- current night-time lighting glare; and,
- concerns that tree clearing would lessen privacy.

Under the Proposed Action, VA would address these issues by: improving stormwater management systems; replacing outdoor lighting fixtures with light-emitting diode (LED) lights that automatically dim to 30% after midnight and that are shielded to prevent them from shining directly at the residences; creating and maintaining a vegetated buffer to obstruct the views between residences and the campus within 50-feet inside of the Manchester VAMC property line (Figure 2); and erecting and maintaining a 6-foot high opaque vinyl privacy fence along the western border of the campus to further obstruct the views of construction and future operational activities at the Manchester VAMC. Temporary fencing would also be installed around work areas during construction.

Figure 2. Proposed Action Privacy Design



Demolition of hardscapes (asphalt paving, concrete around the communication tower) and excavation of subsurface soils and ledge have the potential to release fugitive dust. Additionally, construction activities that expose underlying soils have the potential to collect on construction vehicle tires and be tracked onto roadways inside and beyond the Manchester VAMC campus, generating nuisance concerns about the appearance of the construction site and surrounding roads.

To minimize these potential adverse impacts, the construction contractor would implement industry-standard construction best management practices (BMPs) to limit fugitive dust generation and tracking of loose soil onto roadways. These BMPs include: the use of water trucks or other dust palliatives for dust suppression; physically removing loose soil from construction vehicles' tires before leaving the site; and, if necessary, installing gravel pads at the construction exit to further prevent the tracking of soil onto roadways.

These impact minimization measures would ensure that the Proposed Action would have a short-term, less-than-significant adverse impact on aesthetics and a long-term moderate positive impact due to resolving abutting resident concerns about nuisance lighting and changes to the viewscape. When considered on a cumulative basis with other current and potential future developments in the area, aesthetic impacts from the Proposed Action would not rise to significant adverse levels.

3.3.1.3.2 No Action

Under the No Action alternative, no changes to the current aesthetic or visual character of the grounds would occur at the Proposed Action site. The existing Manchester VAMC would remain as it currently exists for the foreseeable future, the viewscape would not be changed, and abutting resident complaints about nighttime lighting issues would not be resolved.

3.4 Air Quality

Air quality refers to the concentration of air contaminants in a specific location at a given time. Air quality is determined by the type and number of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

3.4.1 Existing Environment

3.4.1.1 Regional Climate

Weather and climate are important influences on air resources. On average, New Hampshire receives approximately 44.2 inches of rainfall per year. Historically, October is the wettest month of the year with average rainfall of 4.5 inches, while February is the driest month with an average rainfall of 3.0 inches (NOAA, 2020). The average temperature in New Hampshire is 46.2 degrees Fahrenheit (ºF). Historically, January is the coldest month with an average temperature of 20.5ºF, and July is the hottest month with an average temperature of 70ºF (NOAA, 2020).

3.4.1.2 Air Quality Standards

The Clean Air Act (CAA) and its subsequent amendments require the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants that may endanger public health or welfare (USEPA, 2021). The USEPA has promulgated primary and secondary NAAQS for six criteria pollutants: carbon monoxide (CO); nitrogen dioxide (NO_2); ozone (O_3); lead (Pb); particulate matter [PM; particulate matter sized 10 microns or less (PM_{10}) and particulate matter sized 2.5 microns or less ($PM_{2.5}$)]; and sulfur dioxide (SO_2). Primary standards set limits to protect public health, and secondary standards set limits to protect public welfare (see Table 2). The CAA also gives the authority to states to establish air quality rules and regulations stricter than the federal standards.

New Hampshire has developed an Air Quality State Implementation Plan (SIP) that outlines regulations, control measures, and strategies to achieve compliance with NAAQS (USEPA, 2020). The New Hampshire Department of Environmental Services (NHDES) implements the SIP.

Table 2. National Ambient Air Quality Standards

NAAQS Pollutant	Primary/ Secondary	Averaging Time	Level(1)	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and secondary	8-hour	70 ppb	Annual 4th highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter ($PM_{2.5}$)	Primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years
	Secondary	Annual	15 $\mu g/m^3$	Annual mean, averaged over 3 years
	Primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
Particulate Matter (PM_{10})	Primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Lead	Primary and secondary	Rolling 3-month average	0.15 $\mu g/m^3$	Not to be exceeded
Sulfur Dioxide	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

1 – Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$)

3.4.1.3 Clean Air Act Conformity

The 1990 amendments to the CAA require federal agencies to ensure that their actions conform to the SIP in a nonattainment area. Under Section 176(c) of the CAA, a project is in "conformity" if it corresponds to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving their expeditious attainment. Conformity further requires that such activities would not:

- cause or contribute to any new violations of any standards in any area;
- increase the frequency or severity of any existing violation of any standards in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The USEPA published final rules on general conformity (40 CFR Parts 51 and 93) in the Federal Register on November 30, 1993. The General Conformity Rule (GCR) (CAA Part 176(c)(4)) applies to all federal actions in nonattainment or maintenance areas. This rule requires that any federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a federal action would not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS. Air Quality Control Regions that comply with the NAAQS are designated "attainment" areas by the USEPA, while areas where the standards are not met are designated as "non-attainment" areas. Hillsborough County is designated as in attainment for all criteria pollutants (USEPA, 2021).

The rules specify *de minimis* emission levels by pollutant to determine the applicability of conformity requirements for a project. The corresponding *de minimis* threshold values for each

criteria pollutant is 100 tons per year. The potential emissions associated with the Proposed Action are required to be compared to the GCR *de minimis* thresholds.

A federal action is exempt from the GCR requirements if the action's total net emissions are below the *de minimis* threshold or are otherwise exempt per 40 CFR 51.153. There are two main components to the overall process: an applicability analysis to determine whether a conformity determination is required; and, if it is, a conformity determination to demonstrate that the action conforms to the SIP. If the Proposed Action emissions are below the thresholds, then a full Conformity Determination is not required.

3.4.1.4 Existing Emissions Sources

Current emissions sources at the Manchester VAMC are primarily associated with boilers and emergency generator engines. The CHP generator engine is not currently operational. The NHDES Air Resources Division has issued the Manchester VAMC a Temporary Permit for the operation of these emission sources. The Temporary Permit is currently under review by NHDES for reissuance. This permit outlines the operation and emission limitations of each emission source.

3.4.1.5 Sensitive Receptors

CEQ's NEPA regulations require evaluation of the degree to which the proposed action affects public health (40 CFR Part 1508.27). Children, the elderly, and people with illnesses are especially sensitive to the effects of air pollutants. Therefore, hospitals, schools, convalescent facilities, religious institutions, and residential areas are considered to be sensitive receptors, particularly when located within 0.25 miles of the emissions source.

The Manchester VAMC patients are considered the nearest receptors followed by the abutting residences within 0.25 miles of the campus.

No schools, convalescent facilities, or religious institutions are present within 0.25 miles of the campus.

3.4.2 Thresholds of Significance

An impact to air quality would be considered significant if it were to affect the achievement or maintenance of NAAQS.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Action

3.4.3.1.1 Particulate Matter Emissions

Construction of the Proposed Action would require heavy equipment with petroleum-fueled engines, resulting in emissions of criteria pollutants (with the exception of lead, which is no longer an additive in these fuels). Construction would also generate particulate matter into the air from activities including land clearing, grading, and vehicles traveling on paved and unpaved surfaces. The amount of particulate matter emissions generated can be estimated from the amount of ground surface exposed, the type and intensity of activity, soil type and conditions, wind speed, and dust control measures.

Total suspended particulates were calculated using the emission factor for heavy construction activity operations from "AP-42, Compilation for Air Pollutant Emission Factors" (USEPA, 1995), to provide a conservative estimate of particulate matter emissions. Particulate emissions estimated to be generated during construction of the Proposed Action area presented in Table 3.

Table 3. Estimate of Particulate Emissions during Construction of the Proposed Action

Total Area (acre)	Exposed Area (acre)	Construction Duration (months)	Emission Factor (tons/acre/month)[1]	Control Efficiency (%)	Total Suspended Particulate Emissions (tons/year)
12	12	16	1.2	80%	0.12

1 – Emission factor for Heavy Construction Operations (USEPA, 1995).

3.4.3.1.2 Off-Road Construction Equipment Emissions

Operation of off-road construction equipment, such as excavators, dozers, loaders, and graders, would emit criteria pollutants during the approximately 16-month construction period, though not necessarily continuously during each month. Based on similar expansion projects, a table of construction equipment and frequency of use was estimated for the Proposed Action (Table 4).

Emissions were estimated using "Off-Road – Model Mobile Source Emission Factors" for the year 2023 from the California South Coast Air Quality Management District (SCAQMD, 2020) because neither New Hampshire nor the VA have issued emission factors. The applicable emission factors are presented in Table 5. The annualized total emissions for these construction activities are presented in Table 6.

Table 4. Estimated Construction Equipment Use

Equipment Type	Number of Units	Operational Hours/Day	Total Days/Year
Other Construction Equipment(1)	1	8	280
Graders	2	4	180
Excavators	2	8	180
Tractors/Loaders/Backhoes	2	4	180
Pavers	2	8	180

1 - The term "Other Construction Equipment" is an umbrella category that includes other common construction equipment used during typical commercial development and allows for a conservative estimate when calculating construction emissions.

Table 5. SCAB Fleet Average Emission Factors (Diesel)

Equipment Type	Emissions Factors(1)				
	CO (lb/hr)	VOC(2) (lb/hr)	NO_2 (lb/hr)	SO_2 (lb/hr)	PM(3) (lb/hr)
Other Construction Equipment	0.3482	0.0483	0.2497	0.0013	0.0092
Graders	0.5718	0.0758	0.4156	0.0015	0.0191
Excavators	0.5097	0.0615	0.2821	0.0013	0.0117
Tractors/Loaders/Backhoes	0.3593	0.0365	0.2127	0.0008	0.0081
Pavers	0.4805	0.0815	0.4432	0.0009	0.0269

1 - From South Coast Air Basin (SCAB), emission factors for year 2023; composite emission factors used.
2 - VOCs are considered equivalent to Reactive Organic Gases for calculating non-road construction equipment emissions.
3 - PM emissions represent combined PM_{10} and $PM_{2.5}$.

Table 6. Total Criteria Pollutant Emissions from Construction Equipment

Equipment Type	CO (tons)	VOC (tons)	NO_2 (tons)	SO_2 (tons)	PM (tons)
Other Construction Equipment	0.3900	0.0541	0.2797	0.0014	0.0103
Graders	0.4117	0.0546	0.2992	0.0011	0.0138
Excavators	0.7339	0.0885	0.4062	0.0019	0.0169
Tractors/Loaders/Backhoes	0.2587	0.0263	0.1532	0.0006	0.0058
Pavers	0.6919	0.1174	0.6382	0.0013	0.0387
Total Emissions (tpy)	**2.4862**	**0.3409**	**1.7765**	**0.0062**	**0.0855**
de minimis level (tpy)	100	100	100	100	100

3.4.3.1.3 On-Road Heavy-Duty Construction/Haul Trucks

Construction of the Proposed Action would utilize on-road heavy-duty vehicles, such as multi-axle dump trailers and flatbed trucks, to transport the demolition debris, excess soil, and felled trees off-site. Table 7 presents a summary of the approximate number of vehicles and frequency of use during the approximately 16-month construction period. Table 8 present a summary of the emissions estimated for on-road diesel-fueled heavy-duty vehicles (greater than 8,501 lbs.) using emissions factors specific to New Hampshire for the year 2023 (USAF, 2020). The assumptions used to develop the on-road construction haul truck emissions estimates are provided in Appendix A.

Table 7. On-Road Heavy-Duty Diesel Vehicle Estimates

Vehicle Type	Estimated Number of Vehicle Trips
Asphalt Trucks	100
Logging Trucks (to haul cleared vegetation)	3
Total Number of Trucks	103
Estimated miles traveled per trip(1)	40
Total miles travelled for all vehicles(2)	**4,140**

1 - The estimated average distance from Manchester VAMC to the materials source is estimated to be 20 miles; therefore, a truck would travel 40 miles round trip.
2 – Total number of trucks multiplied by the miles per trip.

Table 8. On-Road Heavy-Duty Diesel Vehicle Emissions

On-Road Heavy-Duty Diesel Vehicle	Total mileage	CO	VOC	NO_2	SO_2	PM_{10}	$PM_{2.5}$
Emissions, lbs/mile	4,140(1)	0.0029	0.0007	0.0080	<0.0001	0.0002	0.0002
Emissions, lbs/project	--	12.0	2.9	33.0	0.1	1.0	4
Emissions, tons/project	--	**0.006**	**0.001**	**0.016**	**0.0001**	**0.0005**	**0.001**

1 – Total miles travelled, from Table 7.

3.4.3.1.4 Construction Workers' Vehicle Emissions

Emissions were estimated from construction workers' vehicles in use during the Proposed Action construction phase. On average, approximately 25 workers per day are estimated to support the construction phase, with each worker traveling to and from the Manchester VAMC over approximately 20 miles per day for 260 days per year and anticipating a commuting factor of 0.6. This is equivalent to a total of 78,000 miles traveled annually (25 workers * 260 days * 20 miles/vehicle * 0.6). Table 9 presents emission factors specific to New Hampshire for emission year 2023 for gasoline-fueled light-duty vehicles (passenger cars and trucks) (USAF, 2020). Table 10 presents the estimated emissions from construction workers' vehicles.

Table 9. Construction Worker - Emissions Factors for Light-Duty Gasoline-Fueled Vehicles

Light-Duty Gasoline-Fueled Vehicles	CO	VOC	NO_2	SO_2	PM_{10}	$PM_{2.5}$
Emissions factors (lbs/mile)	0.005620	0.000478	0.000306	0.000004	0.000015	0.000013

Table 10. Construction Worker - Emissions from Light-Duty Gasoline-Fueled Vehicles

Light-Duty Gasoline-Fueled Vehicles	CO	VOC	NO_2	SO_2	PM_{10}	$PM_{2.5}$
Emissions, lbs/year(1)	438.3	37.3	23.9	0.3	1.2	1.0
Emissions, tpy	**0.2192**	**0.0187**	**0.0120**	**0.0002**	**0.0006**	**0.0005**

1- Lbs/mile calculation from Table 9 (emission factor multiplied by the total miles travelled annually [78,000 miles]).

3.4.3.1.5 Total Construction Emissions

The total estimated emissions associated with the demolition phase of the Proposed Action are presented in Table 11. Based on these estimates, none of the criteria pollutant concentrations exceed the General Conformity *de minimis* threshold limits. Thus, a formal General Conformity Determination would not be needed. Construction activities would result in only short-term, negligible adverse impacts on air quality. When considered on a cumulative basis with other current and future developments in the area, the Proposed Action would not have a significant adverse effect on air quality.

Table 11. Total Emissions for the Proposed Action Construction Phase

NAAQS:	CO	VOC	NO_2	SO_2	PM_{10}	$PM_{2.5}$
Fugitive Dust Emissions	N/A	N/A	N/A	N/A	0.108	0.016
Off-Road Construction Equipment	2.486	0.341	1.776	0.006	0.086	0.016
Heavy Duty Diesel Truck Construction Equipment Emissions	0.006	0.001	0.016	0.0001	0.0005	0.0005
Construction Worker Vehicle Emissions	0.2192	0.0187	0.0120	0.0002	0.0006	0.0005
Total Construction Emission (typ)	**2.711**	**0.361**	**1.805**	**0.006**	**0.195**	**0.033**
de minimis threshold (typ)	100	100	100	100	100	100

N/A – Not Applicable

3.4.3.1.6 Air Quality Impact Minimization Measures

The Proposed Action would incorporate the following activity- and material-specific BMPs to limit the emissions of criteria pollutants from engines, control airborne dust, and avoid the release of dust that may be laden with regulated building materials.

- Use of equipment with Tier 4-compliant engines to reduce emissions of particulate matter and nitrogen oxides to meet emission standards established by USEPA and California Air Resources Board.
- Limit the idling of mobile emission sources to three minutes; after three minutes turn engines off.
- Cover beds of all incoming and outgoing haul trucks with tarps.
- Visually monitor all construction activities daily, particularly during extended periods of dry weather; implement additional dust control measures as needed
- Implement dust suppression methods identified in VA's Specification 01 57 19: Temporary Environmental Controls. Available methods include application of water, dust palliative, or soil stabilizers; use of enclosures, covers, silt fences, or wheel washers; and suspension of dust-generating activities during sustained high wind conditions (10-40 miles per hour [mph] with gusts at or above 50 mph).
- Maintain speed of construction vehicles on paved roads within the Manchester VAMC and the vicinity at posted limits. This would minimize dust generated by vehicles and equipment on paved surfaces. On any unpaved surfaces at the construction area, vehicle speeds would be maintained at or below 5-miles per hour to prevent dust generation of any exposed soil.

- Stabilize exposed soil with vegetation or mulching to minimize erosion and dust generation.
- During demolition, install filter media over hospital building air intakes to avoid intake of fugitive dust.

Once the construction phase is complete, the Proposed Action would have no further mechanisms to generate criteria pollutants. Operational emissions would be consistent with current emissions at the Manchester VAMC.

3.4.3.2 No Action

Under the No Action alternative, no short- or long-term changes in the type or quantities of air emissions would occur. Therefore, under the No Action alternative, current baseline air emissions would continue unchanged.

3.5 Cultural and Historical Resources

Cultural resources are defined as the physical remains of a people's way of life and include historical architecture and archaeology.

Several federal laws and regulations—including the National Historic Preservation Act (NHPA) of 1966, as amended; the Archaeological and Historic Preservation Act of 1974; the *American Indian Religious Freedom Act* of 1987 (AIRFA); the Archaeological Resource Protection Act of 1979 (ARPA); and the *Native American Graves Protection and Repatriation Act* (NAGPRA) of 1997—have been established to manage cultural resources. Cultural resources include "historic properties" as defined by the NHPA; "cultural items" as defined by the NAGPRA; "archaeological resources" as defined by the ARPA; "sacred sites" as defined by EO 13007 to which access is afforded under AIRFA; and collections and associated records as defined in 36 CFR 79.

The NHPA outlines federal policy to protect historic properties and promote historic preservation in cooperation with other nations, tribal governments, states, and local governments. Section 106 of the NHPA requires federal agencies to identify, evaluate, inventory, and protect historic properties (i.e., those listed or eligible for listing in the National Register of Historic Places [NRHP]) that are under their jurisdiction and control. Federal agencies must delineate the Area of Potential Effect (APE) within which impacts from a proposed action may occur; identify historic properties present within the APE; assess the potential effects of the undertaking on those historic properties; and consider ways to avoid, minimize and mitigate any adverse effects. The APE is the geographic area in which an undertaking may directly or indirectly cause changes in the use or character of a historic property. An undertaking is any federal action with the potential to affect historic properties. Federal agencies are further required to initiate consultation with the State Historic Preservation Officer (SHPO) for actions that may impact historic properties. The New Hampshire Division of Historical Resources serves as the SHPO in New Hampshire.

3.5.1 Existing Environment

To assess the potential presence of cultural resources within the APE, a Phase IA Archaeological Assessment was conducted by R. Christopher Goodwin & Associates, Inc. in June 2015. As part of this effort, a desktop cultural resources literature review and records search was performed. This involved the examination of historical aerial photographs and cartographic resources, and available data provided by the New Hampshire Division of Historical Resources (NHDHR). Additionally, current conditions including the extent of land modification and infrastructure development were assessed during a brief reconnaissance of the campus.

3.5.1.1 Area of Potential Effects (APE)

The APE consists of the area where the Proposed Action has the potential to cause both direct and indirect effects on historic properties. For this project, the entire Manchester VAMC campus is included in the APE. This APE was selected because it represents a contiguous area of buildings and functions that collectively represent the Manchester VAMC.

3.5.1.2 Phase IA Archaeological Assessment

The initial construction of the Manchester VAMC occurred from 1948-1950, on property initially owned by Frederick Smyth, governor of New Hampshire from 1865-1867. The property included the Smyth Tower which was built by Governor Smyth in 1888 as a replica of a Scottish lookout tower and intended as a private retreat. The Smyth Tower and its eleven surrounding acres were donated in 1939 to the City of Manchester by Governor Smyth's widow. After WWII, she donated the Manchester VAMC land to the federal government. A number of buildings have been added to the campus since 1950, with major construction in 1975, 1979, and 1988. Originally comprising only thirteen buildings (including the Smyth Tower), the current complex consists of more than 26 buildings and structures. The majority of the campus is developed, with the exception of some areas along the northeastern, northwestern, and southwestern boundaries. Development in those areas has been impeded by relatively steep slopes, and the installation of water utilities in the southwest corner.

The Smyth Tower was listed in the NRHP in 1978. In 2011, the Manchester VAMC complex itself was determined eligible for listing in both the state and National Registers (Casella, 2010). However, as of May 2015, the complex had not been entered into the online National Register database (NPS, 2015).

Review of the documents related to the construction of the VAMC campus and buildings indicates that it has involved extensive disturbance to the natural soil stratigraphy due to grading, filling, utility installation, and building and other infrastructure construction. The scope of disturbance and infrastructure development is such that it is unlikely that any stratigraphically intact archeological remains pre-dating the construction of the VAMC facility are present. Based on the results of this assessment, and assuming no planned impacts to the National Register-listed Smyth Tower, no further archeological assessments are recommended at the Manchester VAMC.

On July 10 and 11, 2019, VA and the SHPO signed a Memorandum of Agreement (MOA) regarding the demolition of outbuildings 2, 3, 4, 5, 13, and 14 at the Manchester VAMC; demolition is needed to provide additional space for future development, including the Proposed Action. Execution of the MOA stipulations is required prior to demolition of the six outbuildings to mitigate the effect of the undertaking on historic properties. Additionally, these stipulations must be completed prior to the start of construction of the Proposed Action. A copy of the MOA is included in Appendix A.

For the current Proposed Action, VA initiated a Section 106 consultation with the SHPO on November 16, 2020, through the submission of a Request for Project Review form, which included a copy of the Phase IA report. VA's determination of finding for the undertaking was no adverse effect due to the lack of historic conditions in the Proposed Action area.

On December 2, 2020, the SHPO responded by issuing concurrence with this determination of finding contingent on the completion of the MOA. A copy of this concurrence is included in Appendix A. The SHPO would be notified again when the Draft EA is released for a 30-day review and comment period.

3.5.1.3 Native American Resources and Consultation

For all federally proposed actions, federal agencies are required to consult with federally recognized Native American Tribes in accordance with NEPA, NHPA, NAGPRA, EO 13007, *Indian Sacred Sites*, and EO 13175, *Consultation and Coordination with Indian Tribal Governments*.

However, according to the U.S. Department of Housing and Urban Development (HUD) Tribal Directory Assessment Tool, there are no federally recognized Native American tribes with ancestral ties to Hillsborough County, NH (HUD, 2021).

3.5.2 Thresholds of Significance

Impacts to cultural resources would be considered significant if VA's actions were to diminish the integrity of a historic property or archaeological site such that it would no longer be eligible for listing in the NRHP.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

As previously described, no effects on cultural resources are anticipated from the Proposed Action. A review of previously recorded archeological sites, physiographic setting, and historic and recent land use and development has provided information on current archeological potential at the Manchester VAMC. Although the campus is in an area that initially would have possessed a relatively high potential for occupation and use during the Early Archaic through Contact periods, there is no archeological evidence of sites within the campus.

Additionally, the areas where the Proposed Action would disturb the ground within the campus have been highly disturbed as a result of past development, making it unlikely that intact archaeological items that pre-date the construction of the campus would remain.

3.5.3.1.1 Inadvertent Discovery Plan

To further ensure that subsurface activities and upgrading of infrastructure during the Proposed Action does not lead to disturbance and/or removal of previously undiscovered cultural resources, VA would implement an "Inadvertent Discovery" plan according to the NHPA's *Act of 1979* and NAGPRA's EO 13007. Under this plan, if prehistoric or historic artifacts that could be associated with Native American, early European, or American settlement are unearthed at any time during construction or operation of the expansion areas, VA would cease all activities involving subsurface disturbance in the vicinity of the discovery. Should human remains or other cultural items, as defined by NAGPRA, be discovered during project construction, the construction contractor would immediately cease work until VA, a qualified archaeologist, any affected tribes, and the SHPO, are contacted to properly identify and appropriately treat the items in accordance with applicable state and federal law(s). The work would not resume in the area of the discovery until the artifacts have been documented and evaluated for eligibility for the NRHP, in compliance with Section 106 of the NHPA.

3.5.3.2 No Action

The No Action Alternative would have no impact on cultural resources because subsurface activities and upgrading of infrastructure would not occur, leaving potentially undiscovered cultural resources undisturbed.

3.6 Geology, Topography, and Soils

3.6.1 Existing Environment

3.6.1.1 Geology

The Manchester VAMC campus is located within the Seaboard Lowlands section of the New England physiographic province (Flanagan, 1999) in New Hampshire. It is located approximately 1.5 miles east of the Merrimack River, and approximately 2.5 miles north of the confluence of the Merrimack and the Piscataquog Rivers. It is 0.5 miles east of Dorrs Pond.

The area of the Merrimack River valley where the facility is located was inundated during the retreat of the Late Wisconsin glaciation, beginning between 15,000 and 17,000 years ago (Flanagan, 1999). Glacial melt was complete approximately 12,000 years ago (Bond, 1981). Previously farmland, the VAMC campus is currently part of a semiurban setting, surrounded by residential development, and with a major interstate highway (I-93) less than a mile from its easternmost corner.

3.6.1.2 Topography

The Seaboard Lowlands topography is characterized by lower elevation than surrounding provinces with an elevation of 400 to 500 ft in most places.

The elevation at the facility ranges from 422 ft above mean sea level (amsl) at the northern boundary of the campus to approximately 472 ft amsl at the base of the Smyth Tower. The campus occupies a hilltop in an area of rolling topography in the northeastern section of Manchester.

3.6.1.3 Soils

The Proposed Action area was assessed via the United States Department of Agriculture (USDA) Natural Resources Conversation Service (NRCS) soil survey mapping function. A description of each mapped soil unit is provided in the following subsections, while Table 12 summarizes the acreage of each soil unit within the Manchester VAMC within which the Proposed Action would occur. Figure 3 depicts the locations of these soil units throughout the Manchester VAMC.

Figure 3. USDA-NRCS Soil Map

Note: See definition of CmB, CmC, and CoC code in paragraph below

Canton fine sandy loam. 0 to 8% slopes (CmB): This soil is nearly level to gently sloping and is well drained. It is on hilltops and at the base of slopes of hilly uplands. The areas are irregularly shaped and range from 5 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about seven inches thick. The subsoil is yellowish brown fine sandy loam 12-inches thick. The substratum is pale brown and light brownish gray gravelly loamy sand to a depth of 60 inches or more below grade.

Included with this soil are areas of nearly level and gently sloping Scituate soils, stony Canton soils, and other well drained soils. Included soils make up 15 to 20 percent of the unit.

The permeability of this Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. The depth to bedrock is more than 5-feet below grade. The frost-action potential of the soil is low.

Most areas of this soil are used for hay or pasture. A few areas are used for cultivated crops or orchards, and some areas in the cities and suburbs are used for residential development (USDA-NRCS, 1981).

Canton fine sandy loam, 8 to 15% slopes (CmC): This soil is sloping and well drained. It is on side slopes and hills of wooded uplands. The areas are irregularly shaped and range from 5 to 150 acres. Stones that are 1- to 1.5- feet in diameter and 5 to 30 feet apart cover the surface.

Typically, the surface layer is dark brown fine sandy loam about 4-inches thick. The subsoil is yellowish brown fine sandy loam 15-inches thick. The substratum is pale brown and light brownish gray gravelly loamy sand to a depth of 60 inches or more below grade.

Included with this soil are areas of gently sloping Scituate soils, areas of Chatfield soils, and areas of soils with a weak hardpan at a depth of more than 40-inches below grade. Included soils make up 10 to 15 percent of the unit. The permeability of this Canton soil is moderately rapid in the surface layer and subsoil and rapid in the substratum. Available water capacity is moderate. The depth to bedrock is more than 5-feet below grade. The frost-action potential of the soil is low (USDA-NRCS, 1981).

Canton-Urban land complex, 3 to 15% slopes (CoC): This complex consists of gently sloping to sloping Canton soils and urbanized areas. It is in upland areas on the west side of Nashua and on both sides of the Merrimack River valley in Manchester and Goffstown. The areas are irregularly shaped and range from 25 to 300 acres. They are about 50 percent Canton soils, 35 percent urbanized, and 15 percent included soils. The Canton soils and urbanized areas are so intermingled that it was not practical to map them separately.

Typically, the Canton soils have a surface layer of dark brown fine sandy loam about 4-inches thick. The subsoil is yellowish brown fine sandy loam 15-inches thick. The substratum is pale brown and brownish gray gravelly loamy sand to a depth of 60 inches or more below grade.

The urbanized areas are nearly level to sloping, and more than 85 percent of the surface is covered by buildings, asphalt, or concrete. Examples include industrial parks, shopping centers, and parking lots. Some of these areas have been covered by more than 30 inches of fill material or have

had most or all of the original soil removed during grading operations. The fill material is commonly from adjacent areas of Canton soils that have been cut and graded (USDA-NRCS, 1981).

Table 12. USDA-NRCS Soil Characteristics

Soil MapUnit	Soil Map Unit Name	DrainageClass	Hydric (Yes/No)	Acres within ProposedAction area
CmB	Canton fine sandy loam, 0 to 8 percent slopes, very stony	Well drained	No	0.4
CmC	Canton fine sandy loam, 8 to 15 percent slopes, very stony	Well drained	No	1.6
CoC	Canton-Urban land complex, 3 to 15 percent slopes	Well drained	No	32.5
Totals				34.5

3.6.2 Thresholds of Significance

The Proposed Action would be considered to have significant impacts to geology, topography, or soils if it:

- Causes the substantial loss of soils or compaction to the extent that makes it impossible to establish native vegetation within two growing seasons;
- Disturbs a land area larger than 1,000 acres;
- Causes a permanent loss of soil productivity that results from converting previous soils into impervious ground on more than 5-percent of the property;
- Results in topography that does not comply with the overall topography of adjacent land; or,
- Removes or alters soils and causes structural instability to surrounding buildings or infrastructure.

3.6.3 Environmental Consequences

3.6.3.1 Proposed Action

3.6.3.1.1 Geology

The Proposed Action would require ripping of bedrock where ledge is present. However, excavating into the underlying bedrock would not be considered by itself to be, or lead to, an adverse impact on the competency of bedrock at or in the vicinity of the Proposed Action construction area. This is because ripping would only impact the bedrock surface and not cause fracturing elsewhere and leave underlying bedrock intact.

Therefore, construction of the Proposed Action would have a short-term, negligible adverse impact on geology.

3.6.3.1.2 Topography

Construction. The Proposed Action includes regrading to direct stormwater runoff toward new stormwater management catch basins. Suitable on-site soils would be used for grading to the maximum extent practicable. Otherwise, suitable clean fill from an off-site source would be utilized. Overall, there would be no landscape-level changes to topography at the Manchester VAMC during construction and operation, and no impact on topography beyond the campus.