United States Department of the Interior National Park Service

National Register of Historic Places Inventory—Nomination Form

See instructions in How to Complete National Register Forms Type all entries—complete applicable sections

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Name 1.

historic Watervliet Arsenal

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7. Description

Condition

fair

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Check one _X__ original site ____ moved date

Describe the present and original (if known) physical appearance

Check one

Watervliet Arsenal National Historic Landmark consists of approximately 112.5 acres, the major portion of the property of Watervliet Arsenal, a military installation owned and operated by the United States Army, west of the Hudson River in the City of Watervliet, New York. Approximately one-third of the landmark, mostly located east of Buffington Street, consists of military quarters and office buildings. These occupy a park-like setting planted with lawns, mature shade trees and shrubs, and ornamented with fountains and monuments. There are also athletic fields and three small recreational buildings on the site of the original arsenal of 1813. The other two-thirds of the landmark consists of the industrial buildings, laboratories, and support facilities devoted to the manufacture of weaponry. This portion of the landmark property is thoroughly industrial in character. Both zones are crisscrossed by a network of paved roads named for past arsenal commanders.

The landmark is bounded on the east by Broadway, on the north and south by stone walls and chain-link fences along the historic boundaries of the arsenal, and along the west by New York State Route 155, by chain-link fences, and by a line of convenience. The accompanying boundary statement and map set these boundaries more specifically. The stone walls consist of rubble sandstone masonry topped by concrete coping and short chain-link fences, and punctuated at intervals by stone piers. The walls also include a long segment of the wall built by the arsenal along the western boundary of the Erie Canal, and a shorter segment of wall along the eastern boundary of the These latter walls are important landscape elements of the Canal. landmark, both as a record of the path of the Canal and as a The chain-link fences are commemoration of its impact on the arsenal. topped with barbed wire, and extend ubiquitously along those areas of the boundary not served by stone walls, with the exception of the east (Broadway) side, which is enclosed with a wrought-iron picket fence. The landmark boundary also includes four stone and concrete gatehouses.

The administrative offices and military quarters zone occupies the northern and northeastern sections of the arsenal. The northeastern corner of the landmark, adjoining Broadway, occupies the site of the original arsenal of 1813-24, which was gradually demolished between 1840 and 1890. The sites of the original buildings were not redeveloped, but are occupied instead by playing fields that consist primarily of a softball diamond and a nine-hole pitch-and-putt golf course. Athletic facilities also include three tennis courts surrounded by high fences and an in-ground swimming pool, bath house, and pool equipment building. A playground for small children has been created adjacent to the bath house and swimming pool. A physical fitness training course has been established inside the perimeter of the base. The grounds of the arsenal are also ornamented with a

8. Significance

Period

Areas of Significance—Check and justify below

| 1500–1599 | archeology-prehistoric X archeology-historic agriculture X architecture art commerce communications | conservation | Iandscape architectur Iaw Iterature X military music t philosophy politics/government | re religion science sculpture social/ humanitarian theater transportation other (specify) |
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Specific dates 1813-1945

Builder/Architect

Statement of Significance (in one paragraph)

Watervliet Arsenal is the oldest arsenal in continuous operation in the United States, and from the 1820s through the peak of its development during World War Two, it has been the United States Army's most important center for the development and production of large-caliber weapons. Founded in 1813, the arsenal began with manufacture of small, fixed ammunition and artillery accoutrements, then expanded from the 1820s through the 1840s, becoming the United States Army's primary maker of artillery carriages. Since 1887 the arsenal has been the Army's primary producer of large-caliber cannon. Watervliet manufactured the nation's first 16-inch breech-loading cannon in 1902, and was the Army's only producer of this weapon during World Wars One and Two. Watervliet has also held the primary responsibility for maintaining large-weapons capability during peacetime, and for coordinating the build-up of weapons manufacture among private industry during wartime.

In response to the outbreak of the War of 1812 and a plan for the creation of arsenals issued by the recently-instituted Ordnance Department, the United States on July 14, 1813 bought 12 acres along the west side of the Hudson River (now the northeastern corner of the Landmark) at a location then known as Gibbonsville. Construction immediately began on the ten original brick buildings of the "Arsenal at Gibbonsville." The original purpose of the arsenal was the manufacture of fixed ammunition and other small items to outfit both infantry and artillery, such as powder horns, pouches, flints, and cartridge boxes. In 1817 the installation adopted the name "Watervliet Arsenal."

In the 1820s and 1830s the arsenal expanded. Land holdings were increased when two tracts of land were added in 1823; another 30 acres were added in 1828 and 45 more in 1833. Additional purchases of land were made in 1859, 1861, 1866, 1867, 1869, 1918. These purchases constitute nearly the entire landmark property. In 1825 the Erie Canal was completed, crossing the arsenal property in the rear of the original buildings. In 1830 the arsenal made its first application for the use of Canal water to power its manufacturing operations. Several buildings were added, highlighted in 1826 by a large limestone building used for musket storage, demolished in 1889. Two buildings still survive from this period. Bldg. 119 was built in 1828 as a powder magazine; Bldg. 17 was constructed in 1830 as a nitre storehouse. Both had original uses that reflected the arsenal's increased emphasis on gunpowder production and storage during this From 1829 through the 1830s, the arsenal built stone walls period. along its perimeter and along both sides of the Erie Canal. In addition, most of the buildings constructed between 1824 and 1847 were also built of stone.

9. Major Bibliographical References

see continuation sheet

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variety of historic cannon and ordnance of American, British, and French manufacture. These cannon and shot are found along Dalliba Avenue, as bollards at several arsenal intersections, and in two ornamental fountains. Along the northern wall of the arsenal lies a small cemetery bearing several graves marked with marble and granite tombstones.

In the industrial zone of the arsenal the buildings are of larger scale and of consistently functional design in accordance with the engineering requirements of the industrial processes carried on within them. The Big Gun Shop (Bldg. 110), for example, contains both a high bay and a deep shrink pit to accommodate those operations designed to be conducted vertically. The same building also contains a large bridge crane operating on an original steel framework. Generally, however, although the architectural spaces within the major industrial buildings at the arsenal remain intact, most original machinery has been replaced during modernization campaigns.

Central to the industrial zone are the major buildings in which the primary weapons production operations (e.g. gun tube forging and machining, component production) are conducted. Arranged around them are various ancillary structures largely used for materials and ammunition storage, energy transmission, transportation, maintenance, and research. The major buildings are linked by rail spurs that facilitate the movement of heavy weapons, components, and equipment in and out of the arsenal. Although most of the buildings in the industrial zone postdate the 1880s, two ammunition magazines (Bldgs. 119 and 129), built in 1828 and 1849 respectively, also stand here. The railroad network also includes a weapons storage yard of several parallel spurs. A gantry crane (Structure 117) enables flatcars and trucks to be loaded or unloaded. Near the western perimeter of the landmark are an oil storage tank and a grounds maintenance building.

Architecturally, the several periods of expansion to the arsenal's physical plant are strongly differentiated through building materials. The original arsenal of 1813, none of whose buildings remain, was constructed in brick. During the arsenal's first expansion from the 1820s through the 1840s, the preferred material was a gray, variegated limestone, and stone walls were built along the arsenal's perimeter. Brick color tends to distinguish subsequent expansionary periods. Until about 1870, brick structures generally were built of an orange-brown brick, while buildings of the 1888 to 1919 era typically were constructed of red brick. Buildings constructed for World War Two use tend to be constructed of tan brick, with contrasting bands of

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Some buildings in this period, however, like their dark brown brick. predecessors, were constructed of red brick. Two buildings at the arsenal represent a strong contrast to the general tone. The Iron Building (Bldg. 38), of 1859, is an outstanding example of a pre-fabricated cast iron building and the only strongly Italianate design; the Community Bldg. (Bldg. 12) is a wrought iron and glass conservatory built in 1903. Other styles are also represented. Quarters One (Bldg. 1) and Bldg. 6 are Greek-revival designs, the latter containing a small, Doric portico. Two officers' quarters (Bldgs. 2.3) embody Queen Anne designs.

Archaeological resources within the arsenal include a wealth of potential sites, both contributing and non-contributing. According to a 1984 archaeological overview and management plan by the Envirosphere Company, no significant archaeological remains have been excavated at Watervliet; nevertheless, certain portions of the arsenal possess strong potential to yield archaeological sites ranging from prehistoric to the period of occupation as an arsenal. Based principally on documentary research, the Envirosphere Company predicted a total of 146 potentially identifiable archaeological sites within the arsenal, which were enumerated in Table 4-4 (as included) The study found that the greatest potential for of its report. contributing archaeological resources lies within the northeastern section of the arsenal, which coincides with the site of the original arsenal of 1813, none of whose buildings still stand. This area, according to the report, probably has been subjected to moderate degrees of disturbance (30 to 60 percent of the total area). Also recognized were lesser concentrations of potential sites corresponding to known and suspected locations of late nineteenth-century and early twentieth-century arsenal buildings. The report also noted, however, the potential for National Register-eligible prehistoric and pre-arsenal archaeological sites that would not contribute to the landmark. It briefly identified a seventeenth-century Dutch settlement historically known as "Steen Hoeck," the location of which is not precisely understood, as a significant pre-arsenal archaeological resource potentially present. The report further concluded that the portion of original arsenal land lying between Broadway and the Hudson River (now occupied by Interstate Route 787, has suffered over 90 percent ground disturbance, and therefore is not thought to have high potential for significant archaeological remains.

In the individual building descriptions that follow, the terms "key", "contributing", and "non-contributing" describe the degree to which the buildings and structures possess architectural quality and integrity, and historical significance. Buildings described as "key" possess high architectural quality and integrity, and reveal important

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aspects of the Arsenal's historical appearance. "Contributing" buildings or structures are not as important as those labeled "key", but date from the period of historical significance of the Arsenal,

contribute to the integrity of the setting, help to convey its historic feeling, and contain relatively minor alterations. "Non-contributing" buildings or structures do not contribute to the historic appearance of the Arsenal, usually because they are of recent construction, or have been heavily altered, and have therefore lost architectural integrity.

Individual Building Descriptions

(The following list enumerates only those arsenal buildings within the boundaries of the landmark. Buildings within areas of the arsenal excluded from the landmark are not enumerated.)

Bldg. 1 Quarters One (Key) Army Classification no. 1 2-story, L-plan, hipped roof, vernacular Greek-revival residence, w/limestone ashlar bearing walls, coursed in front section, random in rear section, designed by base commander, 1841-2. See HABS/HAER Inventory Sheet

Bldg. 2 Officers' Quarters (Contributing) Army Classification no. 2 2 1/2-story, brick residence, Queen Anne style, irregular plan, steep hip roof with multiple intersecting gables, 1889. See HABS/HAER Inventory Sheet

Bldg. 3 Officers' Quarters (Contributing) Army Classification no. 2 2 1/2-story, brick residence, Queen Anne style, irregular plan, steep hip roof with multiple intersecting gables, 1889. See HABS/HAER Inventory Sheet

Bldg. 4 Officers' Quarters (Contributing) Army Classification no. 2 2-story, brick, rectangular plan, with projecting bays on east and south sides, porches on south, east, and west sides, 1867. See HABS/HAER Inventory Sheet

Bldg. 6 Officers' Quarters' (Contributing) Army Classification no. 2 2-story, 5-bay, T-plan, Greek-revival with fluted Doric portico, hip roof, 2-story rear wing, 1849.

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See HABS/HAER Inventory Sheet

Bldg. 8 Officers' Quarters (Contributing) Army Classification no. 3 1 1/2-story, brick residence, irregular plan, hip roof and cupola, porches on east, west, and south sides, 1890. See HABS/HAER Inventory Sheet

Bldg. 9 Officers' Quarters (Contributing) Army Classification no. 3 2-story, brick residence, T-plan, cross-gable roof, screened porch on east side, 1918. See HABS/HAER Inventory Sheet

Bldg. 10 Campbell Hall (Contributing) Army Classification no. 2 2-story, U-plan, red brick, built in 5 sections, 1894-1942. See HABS/HAER Inventory Sheet

Bldg. 11 North Gatehouse (Contributing) Army Classification no. 4 1-story, 1-bay, stone bldg. w/steel gate and concrete gateposts, 1936.

Bldg. 12 Conservatory (Key) Army Classification no. 1 1-story conservatory, consisting of a domed, central unit and flanking wings, cast iron structure, cypress ribs, 1903. See HABS/HAER Inventory Sheet

Bldg. 15 Garage [orig. lumber warehouse] (Contributing) Army Classification no. 2 1-story, rectangular plan, brick garage, with gable roof, built in two sections, 1870, 1942. See HABS/HAER Inventory Sheet

Bldg. 17 Roads and Grounds Bldg. (Key) Army Classification no. 1 1-story, rubble masonry foundation, brick walls, sandstone watertable, rectangular plan, gable roof with intersecting gable on east side, 1830. See HABS/HAER Inventory Sheet

Bldg. 18 Garage (Contributing) Army Classification no. 4 1-story, brick, square plan, gable roof, 1919. See HABS/HAER Inventory Sheet

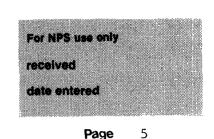
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Bldg. 19 Officers' Quarters (Contributing) Army Classification no. 3 2-story, brick, gable roof, four central chimneys (2 in each wing), built in two sections, 1864, 1902. See HABS/HAER Inventory Sheet Bldg. 20 Major Component Shop (Contributing) Army Classification no. 3 1-story, brick over structural steel, concrete foundation, flat roof with monitors, 1942. See HABS/HAER Inventory Sheet (HABS/HAER rating #4) Bldg. 21 Cafeteria (Contributing) Army Classification no. 3 1-story, brick, rectangular plan, flat roof, 1918. See HABS/HAER Inventory Sheet Bldg. 22 Fire Station (Contributing) Army Classification no. 2 1-story, brick, narrow rectangular plan, intersecting gable roof, small addition to east end, 1848, 1918. See HABS/HAER Inventory Sheet Bldg. 23 Multi-purpose Building (Contributing) Army Classification no. 3 3-story, rectangular plan, reinforced concrete, flat roof, connected to Bldg. 35, 1918. Bldg. 24 Operations Directorate [former Barracks] (Key) Army Classification no. 1 2-story, 7-bay, rectangular plan, coursed limestone ashlar, pilastered corners, gable roof, 2 interior chimneys, central bay emphasized with wide openings, full-width portico removed, 1843. See HABS/HAER Inventory Sheet Bldg. 25 Minor Component Shop (Contributing) Army Classification no. 3 3-story, reinforced concrete walls on structural steel frame, flat roof, 1918, 1942. See HABS/HAER Inventory Sheet Bldg. 29 Switchgear Bldg. (Contributing) Army Classification no. 4 1-story, 1-bay, brick, flat roof, w/array of electrical transformers adjoining, within a chain-link fence, 1942.

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Bldg. 35 Pilot Line Bldg. (Contributing) Army Classification no. 3 2-story, brick over structural steel, monitor roof, irregular plan, enlarged 1941, 1918, 1983. See HABS/HAER Inventory Sheet (HABS/HAER rating #4) Bldg. 36 Water Pollution Control Plant (Non-contributing) Army Classification no. 3 1-story, brick, L-plan, flat roof, 1970. Structure. 37 Water Pollution Control Tank (Non-contributing) Army Classification no. 3 Cylindrical concrete storage tank, 1970. Bldg. 38 Iron Building (Key) Army Classification no. 1 1-story, rectangular plan, exterior wall panels and structural columns of cast iron, interior wrought iron/cast iron Fink trusses, corrugated roof, made by Architectural Iron Works, New York City, 1859. See HABS/HAER Inventory Sheet Structure 39 Sludge Drying Beds (Non-contributing) Army Classification no. 3 Array of five unroofed, concrete, drying beds, 1970. Bldg. 40 Benet Weapons Laboratory (Key) Army Classification no. 2 2-story, gable roof, brick, fork-like plan consisting of a long, north-south wing facing Broadway, augmented by two 2-story and three 1-story rear wings, parallel to each other and perpendicular to the front wing. This building, substantially completed by 1865, was enlarged slightly in 1942. This building had 12/12 sash until 1984, 'when 4/4 sash was substituted on the south, east, and north walls of the front wing; elsewhere in the building, the original openings were blocked and 6/6 windows were installed. See HABS/HAER Inventory Sheet (HABS/HAER rating #1) Bldg. 41 Officers' Club (Contributing) Army Classification no. 2 1-story, brick, rectangular plan, intersecting gables, east and west porticoes, 1840. See HABS/HAER Inventory Sheet

Bldg. 42 Emergency Generating Bldg. (Non-contributing) Army Classification no. 4

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1-story, 1-bay, brick, flat roof obscured by shrubbery, 1960.

Bldg. 43 Main Gate (Contributing) Army Classification no. 3 1-story, 1-bay, stone and glass, flat roof, flanked by double-leaf steel vehicular gates, stone gateposts, and pedestrian gates, 1941.

Bldg. 44 Dalliba Hall (Non-contributing) Army Classification no. 3 1-story plus full basement, brick on steel and concrete frame, flat roof, 1956, addition 1977. See HABS/HAER Inventory Sheet (HABS/HAER rating #4)

Bldg. 46 Garage (Non-contributing) Army Classification no. 3 1-story, 1-bay, brick, gable roof, 1959.

Bldg. 47 Garage (Non-contributing) Army Classification no. 3 1-story, 1-bay, brick, gable roof, 1959.

Bldg. 48 Garage (Non-contributing) Army Classification no. 3 1-story, 3-bay, brick, hipped roof, 1959.

Bldg. 49 Pool Equipment Bldg. (Non-contributing) Army Classification no. 4 1-story, frame and concrete, flat roof w/overhang, 1959.

Bldg. 50 Athletic Bldg. (Contributing) Army Classification no. 3 1-story, 2-bay, center block with shallow gable roof, flanked by 1-bay, hipped wings, 1918. See HABS/HAER Inventory Sheet

Structure. 51 Swimming pool (Non-contributing) Army Classification no. 4 In-ground, concrete swimming pool, surrounded by fence, 1959.

Bldg. 102 Gas Meter Bldg. (Non-contributing) Army Classification no. 4 1-story, 1-bay, sheet metal siding and roof, 1961.

Bldg. 107 Research and Engineering Shed (Non-contributing) Army Classification no. 5 1-story, 1-bay, wood frame, asphalt siding, flat roof, 1952. **United States Department of the Interior** National Park Service

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Bldg. 108 Communications Center (Contributing) Army Classification no. 3 1-story, brick, gable roof, originally connected to Bldg. 110, 1890. See HABS/HAER Inventory Sheet (HABS/HAER rating #4) Bldg. 110 Big Gun Shop [originally Sea Coast Gun Shop] (Key) Army Classification no. 1 2-story, brick, modified rectangular plan, 1245 feet in length, 125 feet wide except where widened by 1-story, brick annexes; interior includes a high bridge crane on an independent structural steel frame extending the length of the building; high central bay and shrink pit for vertical operations; 1888-1892, additions 1917-1941. See HABS/HAER Inventory Sheet Bldg. 111 Gillespie Gatehouse (Non-contributing) Army Classification no. 4 1-story, 1-bay, stone gatehouse, steel gate and stone piers, 1961. Bldg. 113 Battery Bldg. (Contributing) Army Classification no. 4 1-story, 1-bay, brick, gable roof, 1908. Bldg. 114 Research and Engineering Laboratory (Non-contributing) Army Classification no. 4 1 tall story, rectangular plan, tan brick walls over structural steel frame, flat roof, 1942. See HABS/HAER Inventory Sheet Bldg. 115 Maggs Research Center (Contributing) Army Classification no. 3 2-story, rectangular plan, tan brick walls on structural steel frame, flat roof, original windows replaced with insulating panels, 1942. See HABS/HAER Inventory Sheet (HABS/HAER rating #4) Bldg. 116 POL Bldg. (Non-contributing) Army Classification no. 4 1-story, 2-bay, masonry block bldg. w/flat roof, flanked by open, steel-framed sheds, 1979. Structure. 117 Gantry crane (Non-contributing) Army Classification no. 4 Steel structure, approximately 40 feet high, 25 feet wide at the base,

Bldg. 118 Lumber shed (Non-contributing)

100 feet in length; 1983 replacement of old crane.

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Army Classification no. 4 1-story, 4-bay, heavy timber frame structure, flat roof, open sides, 1951. Bldg. 119 Research & Engineering Lab [orig. Powder Magazine] (Key) Army Classification no. 1 1-story, rectangular plan, hip roof with deep overhangs, 4-foot thick random-coursed limestone walls, 1828. See HABS/HAER Inventory Sheet Bldg. 120 Warehouse (Contributing) Army Classification no. 4 3-story, rectangular plan, tan brick on structural steel frame, flat roof, bridge connects with Bldg. 115, 1941. See HABS/HAER Inventory Sheet Bldg. 121 Research and Engineering Lab (Contributing) Army Classification no. 3 2-story, brick-and-glass curtain wall on steel frame, 1942. Bldg. 122 Research and Engineering Lab (Contributing) Army Classification no. 3 1-story, rectangular plan, red brick, gable roof, attached to Bldg. 121 on north, 1918. See HABS/HAER Inventory Sheet Bldg. 123 Degreasing and Cleaning Bldg. (Contributing) Army Classification no. 3 1 tall story, red brick, rectangular plan, gable roof with monitor, 1918, addition 1942. See HABS/HAER Inventory Sheet Bldg. 124 Research and Engineering Lab (Contributing) Army Classification no. 3 1 tall story, rectangular plan, red brick, gable roof with monitor, 1918. See HABS/HAER Inventory Sheet Bldg. 125 Major Component Shop (Contributing) Army Classification no. 3 1 tall story, red brick on structural steel frame, rectangular plan, flat roof with sawtooth monitor, 1918, addition 1942. See HABS/HAER Inventory Sheet Bldg. 126 Steel Stock Bldg. (Contributing) Army Classification no. 3

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1 tall story, rectangular plan, red brick on steel frame, gable roof with monitor, 1918. See HABS/HAER Inventory Sheet

Bldg. 128 Railroad Yard Office (Contributing) Army Classification no. 3 1-story, wood frame, rectangular plan, asphalt siding, gable roof, 1892. See HABS/HAER Inventory Sheet

Bldg. 129 Ammunition Storehouse (Key) Army Classification no. 1 1-story, rectangular plan, limestone walls, slate hip roof with deep overhangs, stone quoins, 1849. See HABS/HAER Inventory Sheet

Bldg. 130 West Storehouse (Contributing) Army Classification no. 3 1-story, rectangular plan, wood and steel frame, flat roof, 1918. See HABS/HAER Inventory Sheet (HABS/HAER rating #4)

Bldg. 132 Roads and Grounds Bldg. (Contributing) Army Classification no. 4 1-story, 3-bay, tan brick, flat roof, 2-bay wing and smokestack adjoining, 1944, addition 1953.

Bldg. 133 Office and Storage Shed (Contributing) Army Classification no. 4 1-story, 9-bay, heavy timber frame bldg, including 4-bay open shed and 5-bay, enclosed, office area, 1944.

Bldg. 134 Cooling Equipment Building (Non-contributing) Army Classification no. 4 1-story, rectangular plan, concrete block, flat roof, 1976.

Bldg. 135 Forge, Tube Shop (Contributing) Army Classification no. 3 1 tall story approximately 80 feet high above shrink pits, rectangular plan approximately 300 feet x 600 feet, flat roof, 1943. See HABS/HAER Inventory Sheet

Bldg. 136 Boiler House (Contributing) Army Classification no. 4 5-level bldg., irregular plan, brick and structural steel, flat roof, 1943, additions 1957, 1978.

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Bldg. 137 Hoist House (Contributing) Army Classification no. 5 1 1/2 stories, 1-bay, frame bldg, asphalt shingle siding, c.1943.

Bldg. 138 Acids Storage (Non-contributing) Army Classification no. 4 1-story, 1-bay, brick and concrete bldg. w/open, concrete shed, 1958.

Bldg. 139 Inert Gas Storage (Non-contributing) Army Classification no. 4 1-story, 1-bay, brick and concrete, 1958.

Bldg. 140 Flammable Gas Storage (Non-contributing) Army Classification no. 4 1-story, 1-bay, brick and concrete, 1958.

Structure 147 Fuel Oil Storage Tank (Non-contributing) Army Classification no. 4 Cylindrical storage tank of welded steel plate, painted white, circumferential stair on east side, 1957.

Structure 148 Railroad trestle (Contributing) Army Classification no. 5 1-story, heavy timber frame trestle, c.1943.

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It is unclear precisely when Watervliet began production of carriages for artillery cannon--probably in the 1820s--but this item apparently did not become a major production article until the late 1830s. The arsenal continued to expand through the 1840s, introducing steam power in 1839, a powder laboratory (Bldg. 41) in 1840, and possibly one of the wings of Bldg. 40 the same year. Designed by the arsenal's commander Major Rufus L. Baker in 1841, Quarters One (Bldg. 1) was completed the following year. A barracks for enlisted men (Bldg. 24) was completed in 1843. Bldg. 22 was constructed in 1843. An officers quarters (Bldg. 6) was completed in 1848. Bldg. 22 was constructed as a carriage storehouse the same year. The primary role of the arsenal as a gun-carriage manufacturer is further reflected in the construction of the Iron Building (Bldg. 38) in 1859 and the front wing of the Broadway shops (Bldg. 40) in 1865. Building 38 is also highly significant architecturally as an early, outstanding, and rare example of a mid-nineteenth century pre-fabricated cast iron building. Gun-carriage making, ammunition and leather items production continued to be the primary functions of the arsenal for two decades following the Civil War, and little further construction was undertaken before the late 1880s.

In 1887 the Army decided to establish at Watervliet Arsenal its manufacture of large coastal defense cannon. Technological advances in weaponry had proved the superiority of steel, breech-loading cannon over muzzle-loaded cast iron pieces, and the Sea Coast Gun Shop (Bldg. 110) was built in 1888-92 to produce large-caliber breech loading cannon, as well as several smaller caliber cannon. Manufacture of the 16-inch guns, the largest cannon made, required perfection of several shrinkage operations to enable the gun tubes to be greatly strengthened. Shrinkage operations, which were conducted upon gun tubes suspended vertically, required both high bays for raising the gun tubes and deep pits into which the tubes could be lowered. An entire decade passed before the first successful guns of this caliber were produced in 1902.

The creation of the Sea Coast Gun Shop inaugurated another major expansion of the arsenal. Railroad facilities were apparently instituted for the first time, replacing the previous reliance upon wagon and water shipment. The Delaware and Hudson Railroad, whose trunk line lay to the west of the arsenal, ran spurs through the rear of the arsenal property to all of the major industrial buildings. Bldg. 128, which has been labeled "the Army's oldest temporary building," was built in 1892 as the railroad yard office. Building 8 was constructed in the 1890's as a residence for the Master Mechanic. The earliest wing of Campbell Hall (Bldg. 10) was added in 1894.

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Watervliet Arsenal

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World War One brought the next wave of expansion to the arsenal, which witnessed the construction of several major buildings. The arsenal commander in 1918, Colonel John E. Munroe, described the effect of this construction program as "the change of the manufacturing plant from what was virtually a jobbing shop to a works designed for quantity production." He reported that the aggregate floor space of the arsenal was doubled in a single year. Foremost of the new buildings was a gun shop (Bldg. 35) for the production of 155mm and 240mm howitzers. A shop (Bldg. 125) for the production of liners for large cannon, and a 3-story, reinforced concrete, breech mechanism shop (Bldg. 25). The gun shop turned out four 240mm and two 155mm guns per day. "Total wartime production amounted to 1,066 new guns of all calibers, 187 guns and howitzers modified or relined, and 161,662 spare parts." Several ancillary buildings were constructed and railroad facilities were greatly enlarged during World War One.

The interwar decades were another long, low period of activity at the arsenal. During the middle of the 1920s, gun manufacturing retrenched to such a scale that production was reduced to one-half of the Sea Coast Gun Shop (Bldg. 110), with the other World War One-era buildings used for storage. With the approach of war in the late 1930s, however, the arsenal played a leading part in the nation's rearmament. War preparations began at the arsenal in 1939 with a three-fold increase in the workforce from the previous year. The workforce rose again by 75 percent, to 1752, in 1940. The arsenal's peacetime responsibility as the nation's central repository of the knowledge of cannon manufacture gained renewed importance. In 1942, the arsenal's engineering officer commented on Watervliet's central role as a bridge between peacetime and wartime weapons production:

Some two and a half years ago, when the re-armament of the United States was started, all of the cannon business in the Army was concentrated at the Watervliet Arsenal. Acting under orders of the Chief of Ordnance, private industry was circularized and slowly but surely production was inaugurated under arsenal guidance in privately-owned plants. Businessmen came to the arsenal and obtained their contracts. Engineers and master mechanics came to the arsenal and spent weeks in our shops and our drafting rooms learning about the material they were to produce.

During World War Two, Watervliet Arsenal reached its zenith. It was the national center for coordination of the private-sector production of Army cannon and the nation's only manufacturing plant for Army guns of 155mm and larger. Total employment continued its dramatic rise, peaking at over 9,332 in 1942, more than 20 times the 1938 level.

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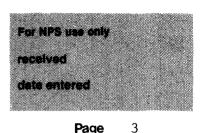
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What required a year to produce in 1938 was being made in 1942 in less than a day. At least twelve new buildings were constructed during the war, and most of the existing buildings were renovated or altered. Two parcels totaling twenty additional acres of land were bought to the southwest and west of the arsenal property. The more westerly of the two tracts, separated from the rest of the arsenal by Route 155, was not provided with heat, and quickly came to be known among arsenal personnel as "Siberia," a peripheral area of the facility used primarily for storage. The other tract, which enlarged the arsenal to the southwest, furnished a site for Bldg. 135, completed in 1943, a new, large-caliber weapons shop. Like Bldg. 110, Bldg. 135 contained coldworking equipment and shrink pits. Bldgs. 114 and 115 were completed in 1942 and used for tank repair and reconditioning. Building 20 was constructed for the production of 4.5-inch guns. Building 120 was added for warehousing, and Building 112 was constructed for proof firing and testing. Early in the war, production was concentrated on 37mm and 75mm weapons, to be installed on tanks, anti-tank vehicles, and in airplanes. In 1943, however, concentration shifted to production of large mobile artillery pieces, in preparation for the invasion of Europe. The 155mm cannon was the most important of these large guns. Nicknamed "Long Tom," this gun, a towed weapon, could fire 6-inch shells up to 14 miles. The arsenal also manufactured an 8-inch gun with a range of up to 20 miles, 16-inch guns for the Navy, and other large-caliber guns.

Activity at the arsenal once again declined rapidly after the war. Consistent with the pattern of previous peacetime retrenchments, manufacturing shrank to a small fraction of previous output. Watervliet Arsenal became a research-and-development facility for weapons, which except for the larger guns, were increasingly farmed out for production by private industry. Watervliet Arsenal increasingly became a research and development facility for weapons, with production being limited to smaller quantities of cannon of small and medium calibers. Except for major new construction during the recent "REARM" program (1979-84), most buildings added during the last four decades have been minor in character. The physical plan of the arsenal has not been greatly altered since World War Two.

Potential contributing archaeological elements consist of arsenal-related sites and the Erie Canal. Some of the Erie Canal ran through the eastern portion of Watervliet Arsenal, and was utilized for water power, as a means of transporting and receiving goods, and for fire protection. Today, the Canal site may contain remains that could yield important information about early arsenal or Canal-related activities. Early arsenal-related archaeological sites are strongly suspected in the northeastern portion of the arsenal

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property. In 1813, the U.S. Government built ten structures constituting the arsenal complex. By 1881, all of these original buildings were demolished, although the locations of at least two of the original arsenal structures have been identified (Envirosphere 1984). Archaeological remains of these buildings could provide

significant information on nineteenth century military manufacturing techniques and could be important to further understanding the early development of the arsenal. Other potentially contributing archaeological sites could include later nineteenth-century and early twentieth-century military industrial buildings, arsenal residential structures, and related outbuildings.

The Watervliet Arsenal has several other potential archaeological components that do not contribute to the landmark itself, but may possess significance on a regional, state, or local level. These may include, for example, the seventeenth-century Dutch settlement of Steen Hoeck, which may coincide with the arsenal's original location. Eighteenth-century and early nineteenth-century sites unrelated to the arsenal also potentially remain.

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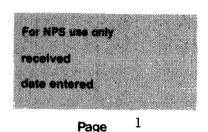
MAJOR BIBLIOGRAPHIC REFERENCES

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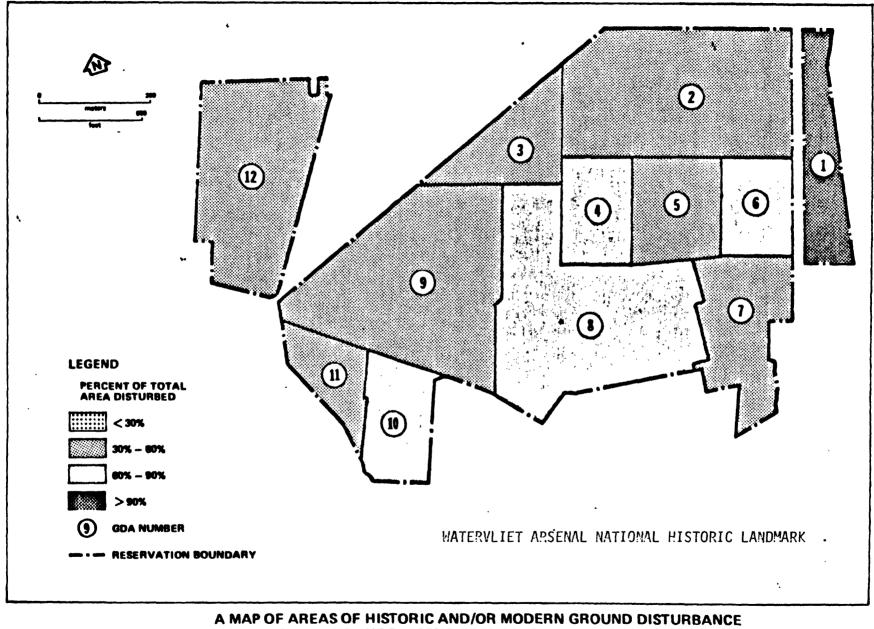
Kacharian, John C. (comp.) <u>Watervliet Arsenal, Yesterday, Today: A</u> <u>Graphical History</u>. Schenectady, New York: Acme Press, 1984.

Watervliet Arsenal. <u>A History of Watervliet Arsenal 1813-1982.</u> Watervliet, New York, 1982.

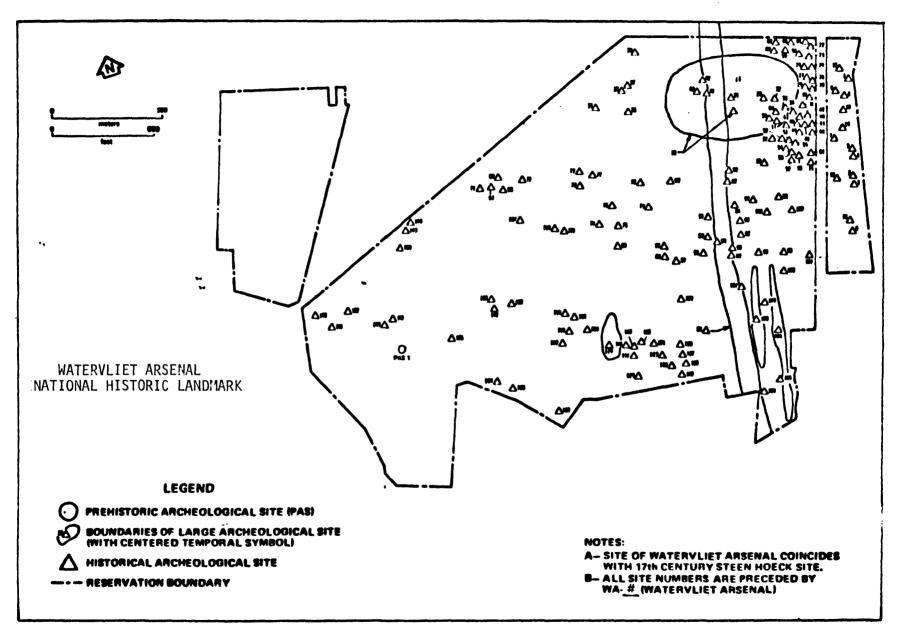


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THAT MIGHT LIMIT THE PRESENT ARCHEOLOGICAL RESOURCE BASE ON WATERVLIET ARSENAL. Source: Envirosphere Co. Report (1984)



A MAP OF POTENTIAL ARCHEOLOGICAL RESOURCE LOCATIONS ON WATERVLIET ARSENAL Source: Envirosphere Co. Report (1984)

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL

| Site Number, Name ^a | Reference ^C | | esearch /alue CR ^b |
|-----------------------------------|---|---|-------------------------------------|
| Steen Hoeck | Huey, 1983, personal communication Huey, 1978 Pearson 1868 Van Laer 1916, 1917, 1918 | Seventeenth century develop- ment north of Schuyler Flatts | 3 |
| WA- Prehistoric Site-1 | Anonymous Informant, 1983, personal communication | Several stone tools, possibly pottery, allegedly discovered in vicinity of bldgs. 135, 136, 125 (not verified by Arsenal Historian) | 2 |
| WA-1 | Map No. 9 (1875)* | Outlet to river shown as indentation along shoreline | 2 |
| WA-2 | Map No. 9 (1875)* | Man-altered shoreline configuration | 2 |
| WA-3 | Dwg. D-2-22 (1918)* | New pumping station | 2 |
| WA-4 | Dwg. D-2-22 (1918)* | 20 Ton Wharf Crane | 2 |
| WA-5 | Dwg. D-2-22 (1918)* | 80 Ton Wharf Crane | 2 |
| WA-6 | Dwg. D-2-22 (1918)* | Iron Fence Around south and west sides of Arsenal | 1 |
| WA-7 | Dwg. D-2-22 (1918)* | North Waiting Room | 1 |
| WA-8 | Dwg. D-2-22 (1918)* | South Waiting Room | 1 |
| WA-9 | Dwg. D-2-22 (1918)* | Railroad Tracks | 1 |
| WA-10 | Dwg. D-2-22 (1918)* | Wharf | 1 |
| WA-11 | FD-32-31A (1932)* | U.S. Coast Guard Base | 1 |
| WA-12 | FD-32-31A (1932)* | New Inlet Along Shoreline | 2 |
| WA-13 | Site Plan (1968)* | South Gate House | 1 |
| WA-14 | (Map #1) Site Plan (1968)* | Parking Lot | 1 |
| | (Map #1) | | • |
| WA-15 | Dwg. 6-L-34 (ca. 1920)* | | 1 |
| WA-16 WA-17 | Dwg. 6-L-34 (ca. 1920)* Dwg. 6-L-34 (ca. 1920)* | | 3 |
| WA-17 WA-18 | Anon n.d.: 61 | Civil War encampment on ground | |
| WA-10 WA-19 | Anon 1.d.: 01 Dwg. 6-L-34 (ca. 1920)* | | s 5 2 |
| WA-20 | Dwg. $6-L-34$ (ca. 1920)* | | 1 |
| WA-21 | Dwg. $6-L-34$ (ca. 1920)* | | 2 |
| WA-22 | Barton 1869 | Stream leading out of Arsenal | 1 |
| WA-23 | Barton 1869 | Gardens | 1 |
| WA-24 | Barton 1869 | North Brick Quarters | 3 |

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL (Continued)

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| Site Number, Name ^a | Reference ^C | Description | Researc Value CR ^b |
|-----------------------------------|--|------------------------------|---|
| WA-25 | Barton 1869 | Hospital Offices | 2 |
| WA-26 | Barton 1869 | Brick Arsenal | 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| WA-27 | Barton 1869 | Formal Gardens | 3 |
| WA-28 | Barton 1869 | South Brick Quarters | 3 |
| WA-29 | Barton 1869 | Offices and Commissary Store | 3 |
| WA-30 | Barton 1869 | Formal Gardens | 3 |
| WA-31 | Barton 1869 | Pond | 2 |
| WA-32 | Barton 1869 | Laboratory | 3 |
| WA-33 | Barton 1869 | Iron Store | 3 |
| WA-34 | Barton 1869 | Harness and Paint Shop | 3 |
| WA-35 | Barton 1869 | East Magazine | |
| WA-36 | Barton 1869 | North Timber Store House | 1 |
| WA-37 | Barton 1869 | Wood Stables (2) | 1 |
| WA-38 | Barton 1869 | Brick Stables | 2 3 |
| WA-39 | Barton 1869 | Magazine Keepers Quarters | 3 |
| WA-40 | Barton 1869 | Timber Stores (3) | 1 |
| WA-41 | Barton 1869 | Nitre Store | 2 |
| WA-42 | Barton 1869 | North Carriage Store | 2 |
| WA-43 | Dwg. #4, D-2-13,* Historical Map (1910) | Brick Arsenal | 2 |
| WA-44 | Dwg. #4, D-2-13,* Historical Map (1910) | C.O. Quarters | 3 |
| WA-45 | Dwg. #4, D-2-13,* Historical Map (1910) | Cistern | 3 |
| WA-46 | Dwg. #4, D-2-13,* Historical Map (1910) | Barracks/Hospital | 3 |
| WA-47 | Dwg. #4, D-2-13,* Historical Map (1910) | E. M. Quarters | 3 |
| WA-48 | Dwg. #4, D-2-13,* Historical Map (1910) | Quarters | 3 |
| WA-49 | Dwg. #4, D-2-13,* Historical Map (1910) | E.M. Quarters | 3 |
| WA-50 | Dwg. #4, D-2-13,* Historical Map (1910) | Salute Gunshed | 3 |
| WA-51 | Dwg. #4, D-2-13,* Historical Map (1910) | S. Gunhouse | 3 |
| WA-52 | Dwg. #4, D-2-13,* Historical Map (1910) | Woodshed | 1 |
| WA-53 | Dwg. #4, D-2-13,* Historical Map (1910) | Woodshed | 1 |
| WA -54 | Dwg. #4, D-2-13,* Historical Map (1910) | Gunhouse | 3 |
| WA-55 | Dwg. #4, D-2-13,* Historical Map (1910) | Laboratory | 3 |

WATERVLIET ARSENAL NATIONAL HISTORIC LANDMARK

Source: Envirosphere Co. Report (1984)

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL (Continued)

| Site Number, Name ^a | Reference ^C | Description | Researcl Value CRb |
|-----------------------------------|--|---------------------------------|--------------------------|
| WA-56 | Dwg. #4, D-2-13,* Historical Map (1910) | Smith Shop and Foundry | 3 |
| WA-57 | Dwg. #4, D-2-13,* Historical Map (1910) | Coal House | 1 |
| WA-58 | Dwg. #4, D-2-13,* Historical Map (1910) | Stables | 2 |
| WA-59 | Dwg. #4, D-2-13,* Historical Map (1910) | Stables | 2 |
| WA-60 | Dwg. #4, D-2-13,* Historical Map (1910) | North Gunhouse | 3 |
| WA-61 | Dwg. #4, D-2-13,* Historical Map (1910) | Saw Mill | 2 |
| WA-62 | Catalog #22113* (first file) (1894) | Storehouse | 2 |
| WA -63 | Dwg. #2, D-2-21, (1924)* | Bandstand | 1 |
| WA-64 | Dwg. #2, D-2-21, (1924)* | Roads near Bandstand | 1 |
| WA-65 | Dwg. #7, D-7-27* (F-2-27) (1918) | Cemetery | ī |
| WA-66 | Dwg. #6, D-2-22* (FS#7) (1918) | Tennis Courts | 1 |
| WA-67 | Dwg. #6, D-22* (FS#7) (1918) | Machine Storage | 1 |
| WA-68 | Dwg. #6, D-22* (FS#7) (1918) | Engine House | 2 |
| WA-69 | Dwg. #6, D-22* (FS#7) (1918) | Roads and Track Areas | 1 |
| WA-70 | Catalog #22113,* (first file) (1894) | Unidentified Structure | 1 |
| WA-71 | Catalog 22113,* (first file) (1894) | Cottage | 3 |
| WA-72 | Map No. 9 (1875)* | Brick Stable | 2 |
| WA-73 | Map No. 9 (1875)* | 011 Tank House | 1 |
| NA-74 | Dwg. #2, D-2-21* (1924) | Garage | 1 |
| WA -75 | Dwg. #2, D-2-21* (1924) | Cow Barn | 1 |
| WA-76 | Dwg. 6-L-34 (ca. 1920)* | Wagon Shed | 1 |
| WA-77 | Dwg. #6, D-2-22* (FS#7) (1918) | Firehouse | 2 |
| WA-78 | Dwg. #6, D-2-33* (FS#7) (1918) | Motor Transport Repair House | 2 |

WATERVLIET ARSENAL NATIONAL HISTORIC LANDMARK

Source: Envirosphere Co. Report (1984)

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL (Continued)

| Site Number, Name ^a | Referenc e^c | Description | Research Value CR ^b |
|-----------------------------------|--|---|--------------------------------------|
| WA-79 | Dwg. #6, D-2-22* (FS#7) (1918) | Sentry Box | 1 |
| WA-80 | Dwg. #4, D-2-13* Historical Map (1910) | Unidentified Building | 1 |
| WA-81 | Dwg. #5, 1859-1891* | Erie Canal (possibly 1875) | 3 |
| WA-82 | Dwg. #5, 1859-1891* | Unidentified Structure (possibly 1875) | 1 |
| WA-83 | Beers 1845 | Pond | 2 |
| WA-84 | Beers 1845 | Store House | 1 |
| WA-85 | Beers 1845 | Ice House | 1 |
| WA-86 | Beers 1845 | Ice House | 1 |
| WA-87 | Beers 1845 | Hospital | 3 |
| WA-88 | Beers 1845 | Coal Yards | 1 |
| WA-89 | Dwg. #6, D-2-22 (1918)* | | ī |
| WA-90 | Dwg. #6, D-2-22 (1918)* | | 1 |
| WA-91 | | 011 Storage Building and Yar | |
| WA-92 | Dwg. #6, D-2-22 (1918)* | | 2 |
| WA-93 | Dwg. #2, D-2-21 (1924)* | | 1 |
| WA-94 | Dwg. #2, D-2-21 (1924)* | | 1 |
| WA-95 | Dwg. FD-32-31A (1932)* | Corral | 1 |
| WA-96 | Dwg. #4, D-2-13* Historical Map (1910) | Paint and Harness Shop | 3 |
| WA-97 | Dwg. #4, D-2-13* Historical Map (1910) | Coal House | 3 |
| WA98 | Beers 1845 | Machine Shop | 3 |
| WA-99 | Beers 1845 | Pond | 3 2 3 3 |
| WA-100 | Beers 1845 | Iron Store | 3 |
| WA-101 | Beers 1845 | Machine Shop | 3 |
| WA-102 | Dwg. #5, 1859-1891* (possibly 1875) | Stone Culvert Leading Water from Machine Shop, under Albany St, to River | 1 |
| WA-103 | Beers 1845 | City Streets and Lots Shown (No Structures Indicated) | 3 |
| WA-104 | Barton 1869 | A. Viele and Co. Iron Foundry | y 3 |
| WA-105 | Barton 1869 | S Reformed Dutch Church | 3 |
| WA-106 | Barton 1869 | Nineteenth Century House and Yards Between Renssalaer St. and North Street. | 3 |
| WA-107 | Catalog #22113* (first file (1894) | Coal Shed | 1 |
| WA-108 | Dwg. 6-L-34 (ca. 1920)* | Celery House | 1 |
| WA-109 | Dwg. FD-32-31A (1932)* | - | 1 |

WATERVLIET ARSENAL NATIONAL HISTORIC LANDMARK

Source: Envirosphere Co, Report (1984) 4

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDE. ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL (Continued)

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| Site Number, Namea | Reference ^C | Description | Research Value CR ^b |
|-----------------------|--|------------------------------|--------------------------------------|
| WA-110 | Dwg. #6, D-2-22 (1918)* | Section of Building 108 | 3 |
| WA-111 | Dwg. #6, D-2-22 (1918)* | | 3 |
| WA-112 | Dwg. #6, D-2-22 (1918)* | Building 103 | 1 |
| WA-113 | Dwg. #6, D-2-22 (1918)* | Building 104 | 1 |
| WA-114 | | | 3 2 2 2 2 2 |
| WA-115 | Dwg. #8 (1961)* | Building 105 Building S33 | 2 |
| WA-116 | Dwg. FD-32-31A (1932)* | Building S37 | 2 |
| WA-117 | Dwg. #6, D-2-22 (1918)* | | 2 |
| WA-118 | Dwg. FD-32-31A (1932)* | Building S29 | 2 |
| WA-119 | Dwg. #6. D-2-22 (1918)* | Building 30 | 3 |
| WA-120 | Dwg. #2, D-2-21 (1924)* | Part of Buffington Street | 1 |
| WA-121 | Dwg. #2, D-2-21 (1924)* | | 1 |
| WA-122 | Dwg. #2. D-2-21 (1924)* | Officers Quarters | • 3 |
| WA-123 | Dwg. #2, D-2-21 (1924)* | Lumbersheds | 1 |
| WA-124 | Dwg. 6-L-34 (ca. 1920)* | Cantonment Buildings | 3 |
| WA-125 | Dwg. 6-L-34 (ca. 1920)* | | 3 |
| WA-126 | Dwg. #6, D-2-22 (1918)* | | 3 3 3 3 |
| WA-127 | Dwg. #6, D-2-22 (1918)* | | 3 |
| WA-128 | | Building Material Storage | 1 |
| WA-129 | Catalog #22113* (first file) (1894) | Barracks and Cottages | 3 |
| WA-130 | Map No. 9 (1875)* | Cemetery | 1 |
| WA-131 | Beers (1845) | Timber Storehouse | 1 |
| WA-132 | Beers (1845) | Perimeter Wall | 1 |
| WA-133 | Map No. 9 (1875)* | Carriage Sheds | 1 |
| WA-134 | Catalog #2213,* (first file) (1894) | Unidentified Structure | 1 |
| WA-135 | Catalog #2213,* (first file) (1894) | Tracks | 1 |
| WA-136 | Dwg. D-2-19 (1895)* | Water Tower | 1 |
| WA-137 | Dwg. #6, D-2-22 (1918)* | | 2 |
| WA-138 | Dwg. #6. D-2-22 (1918)* | | ī |
| WA-139 | Dwg. #6. D-2-22 (1918)* | | ī |
| WA-140 | Dwg. #6, D-2-22 (1918)* | | ī |
| WA-141 | Dwg. #6. D-2-22 (1918)* | | ī |
| WA-142 | Dwg. 6-L-34 (ca. 1920)* | | ī |

MATERVLIET ARSENAL NATIONAL HISTROIC LANDMARK

Source: Envirosphere Co. Report (1984).

POTENTIALLY IDENTIFIABLE BUT NOT PRESENTLY RECORDED ARCHEOLOGICAL RESOURCES AT WATERVLIET ARSENAL (Concluded)

| Site Number, Name a | Reference ^C Description | Research Value CRb |
|-------------------------------|--|--------------------------|
| WA-143 | Dwg. #2, D-2-21 (1924)* Hose House | 1 |
| WA-144 | Dwg. #2, D-2-21 (1924)* Sentry Box | 1 |
| WA-145 | Dwg. #2, D-2-21 (1924)* Yard Master's Office | 2 |
| WA-146 | Dwg. FD-32-31A (1932)* Incinerator | 1 |

Notes: a. Designation assigned for this study

- b. Confidence Rating (CR): 1 = resource has little research value or the information about it is unreliable, 2 = resource may have research value and the information about it is probably reliable, 3 = resource may have research value and the information about it is reliable
- c. * = Watervliet Arsenal's file designations. Other references
 are published sources.

WATERVLIET ARSENAL NATIONAL HISTORIC LANDMARK

Source: Envirosphere Co. Report (1984).