United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: Muscle Shoals Reservation

Other names/site number: United States Nitrate Plant No. 2; National Fertilizer Development Center; TVA Environmental Research Center

Name of related multiple property listing**:**

N/A

(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Wilson Dam Highway

City or town: Muscle Shoals State: Alabama (AL) County: Colbert (033)

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

_X__national ___statewide ___local

Applicable National Register Criteria:

_X__A ___B _X__C ___D

Signature of certifying official/Title: **Date**

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title : **State or Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

_____

Signature of the Keeper Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	☐
Public – Local	☐
Public – State	☐
Public – Federal	X

Category of Property

(Check only **one** box.)

Building(s)	☐
District	X
Site	☐
Structure	☐
Object	☐

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
36	8	buildings
		sites
7		structures
		objects
43	8	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use
Historic Functions
(Enter categories from instructions.)
INDUSTRY/manufacturing facility
DEFENSE/arms storage
EDUCATION/research facility

Current Functions
(Enter categories from instructions.)
VACANT/NOT IN USE
GOVERNMENT/government office

7. Description

Architectural Classification
(Enter categories from instructions.)
LATE 19TH AND EARLY 20TH CENTURY AMERICAN MOVEMENTS/Commercial Style
MODERN MOVEMENT/International Style

Materials: (enter categories from instructions.)
Principal exterior materials of the property:

foundation: CONCRETE
walls: BRICK
roof: SYNTHETICS/Vinyl
CONCRETE
METAL/Steel

Narrative Description
(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Muscle Shoals Reservation Historic District (MSRHD) consists of 44 buildings and seven structures located on the east side of Wilson Dam Highway, west of Wilson Dam, in Muscle Shoals, Colbert County, Alabama. Overall, individual buildings within the MSRHD are in poor condition but retain adequate integrity to portray their significance as components of an early-to-mid-twentieth century industrial complex. Most windows and many doorways have been infilled with corrugated fiberglass or concrete blocks, and some roof monitors have been removed. In addition, the buildings are in a general state of disrepair. However, the contributing buildings retain their original form and continue to reflect their original use and design. While individual buildings may be altered or in poor condition, as a whole the district retains integrity of design, location, setting, and feeling. No buildings have been altered to the point they are no longer contributing to the district. Modern intrusions are minimal, and all buildings retain their

original façades. Where buildings or structures have been demolished, spaces have been left open without modern infill.

The MSRHD is located on the southern banks of the Tennessee River, west of the Tennessee Valley Authority's Wilson Hydroelectric Plant and Dam. The Muscle Shoals Reservation is surrounded by wooded areas and open fields that stretch to the outer limits of the town of Sheffield to the west, and the City of Muscle Shoals to the south. The surrounding buildings to the north, east, and west have not been included in the boundary of the district due to their disassociation with the history of the district, or are of modern construction.

Narrative Description

Individual Building Descriptions

1. Building 5A, ca. 1918 1 contributing building.

Located at the southern end of the MSR, Building 5A originally served as the location where ammonia and nitric acid were processed to create ammonium nitrate. The building is currently vacant. The steel-frame building sits on a concrete slab foundation and is clad with hollow clay blocks. Highlighting the building are red brick quoins and window surrounds. The building is capped with a monitor roof covered with corrugated metal sheeting and features a continuous band of fixed clerestory metal sashes. The east and west elevations are six bays in width and are pierced by tri-part multi-light metal sashes with concrete sills. Three wooden swinging doors provide pedestrian access on the first level, and two wooden doors accessed by steel stairways provide access to the second level. Early photographs of the building indicate that an additional exterior staircase was attached to the east elevation, however, it is no longer extant. A pair of metal swinging doors at the north end of the east elevation provide vehicular access. The north elevation features a central concrete loading pad and a pair of sliding wood and metal doors. A corrugated metal awning connects the north elevation of this building to the adjacent bulk storage building (#2).

2. Bulk Storage Building, ca. 1980 1 non-contributing building.

Located at the southern end of the MSR, the bulk storage building functions as a storage facility. The steel frame building rests on a concrete slab foundation, and has a low-pitch gable roof covered with steel sheeting. The lower portion of the building is clad with concrete slabs, with the upper area covered with corrugated sheet metal. Fenestration is limited to metal overhead doors on each elevation that provide pedestrian and vehicular access to the structure. The bulk storage building is connected to the 5A building (#1) by a central corrugated metal awning projecting from the south elevation.

3. Substation No. 21, ca. 1980 1 non-contributing building.

Located north of the bulk storage building (#2), substation no. 21 once provided electrical regulation and distribution, but is no longer in use. The one-story, one-bay, steel-framed structure sits on a concrete slab foundation, and is clad in brick veneer. The building has a flat roof covered with standing seam metal. The east elevation features a metal overhead and a metal swinging door to provide both pedestrian and vehicular access. Fenestration on the north elevation includes a metal swinging door and two rectangular metal louvered vents.

4. Building 3A ca. 1918 1 contributing building.

Located at the southern end of the MSR, the building originally was the location where ammonia and nitric acid were processed to make ammonium nitrate. The building is currently used to store general equipment. The steel-frame building sits on a concrete slab foundation and is clad with hollow clay blocks. Highlighting the building are red brick quoins and window surrounds. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows covered with corrugated fiberglass panels. On the east and west elevations, three wooden swinging doors provide pedestrian access on the first level, and two wooden doors accessed by steel stairways provide access to the second level. Only one steel staircase remains extant. A pair of wooden sliding doors on the south elevation provide vehicular access. All window openings are covered by corrugated fiberglass panels.

5. Building 2A, ca. 1918 1 contributing building.

Located at the southern end of the MSR, the 2A building originally was the location where ammonia and nitric acid were processed to make ammonium nitrate. The building is currently used for chemical storage. The steel-frame building sits on a concrete slab foundation and is clad with hollow clay blocks. Highlighting the building are red brick quoins and window surrounds. The building has a gable roof covered with corrugated metal sheeting. It is likely that this building once had a monitor roof with clerestory windows similar to Buildings 3A and 5A (#1, #4 respectively), but this feature is no longer extant. Attached to the south elevation is a steel-frame addition. The addition is partially open and features a shed roof and an exterior clad with corrugated metal. A central metal overhead door and a single metal swinging door on the south elevation provide vehicular and pedestrian access. The building is comprised of six bays in length, each containing a pair of windows, however all fenestration is covered by corrugated fiberglass panels. The east and west elevations each feature a metal swinging door and a doorway with concrete block infill. A pair of rectangular louvered vents on the east and west elevations provide ventilation.

6. Catalyzer No. 6, ca. 1918 1 contributing building.

The Catalyzer No. 6 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 7-11) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers. The interior of the west half of the 50 foot by 210 foot building was later adapted to include office space and housed the nitrate plant office, but the structure is

currently vacant. The building sits on a concrete slab foundation and, a partially exposed steel frame. The exterior of the building is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the window openings contain brick infill or are covered by corrugated fiberglass panels. Concrete lintels adorn each original window opening. All window openings along the west elevation of the building, and most windows on the north elevation, were later infilled with red brick and replaced with four six-light metal sashes. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows partially covered in corrugated fiberglass panels. The lower portion of the building is partially clad with concrete blocks. The east elevation features two doorways with concrete block infill, and two circular openings sealed with red brick infill. A metal overhead door at the eastern end of the north elevation and two metal swinging doors protected by metal awnings on the south elevation provide access to the building. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes.

7. Catalyzer No. 5, ca. 1918 1 contributing building.

The Catalyzer No. 5 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 6,8-11) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers, but the 50 foot by 210 foot building is currently vacant. The building sits on a concrete slab foundation, has a partially exposed steel frame, and is clad with hollow clay blocks with red brick quoins and window surrounds. The lower portion of the building is partially clad with louvered wooden vents, however most are missing. Fenestration includes operable 15-light metal sashes with concrete lintels and sills. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes. A pair of wooden doors on the west elevation provided access to the interior of the building. Two circular openings pierce the east elevation and once housed pipes leading from the catalyzers to the cooler and absorption tower buildings.

8. Catalyzer No. 4, ca. 1918 1 contributing building.

The Catalyzer No. 4 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 6, 7,9-11) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers. The interior of the west half of the 50 foot by 210 foot building was later adapted to house the high pressure laboratory, but the structure is currently vacant. The building sits on a concrete slab foundation, has a partially exposed steel frame, and is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the wall openings contain brick infill or are covered by corrugated fiberglass panels. Concrete lintels adorn each original window opening. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows partially covered in corrugated fiberglass panels. The lower portion of the building is partially clad with concrete blocks. The east elevation features two doorways with concrete block infill, and two circular openings sealed with red brick infill. An original window opening on the west elevation has been infilled and pierced with a single metal door and provides access to the building, along with two

metal doors on the north elevation. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes. A concrete block structure is attached to the building's north elevation, and features a shed roof covered in metal sheeting. The structure's west elevation is open. A metal staircase on the south elevation provides access to the roof.

9. Catalyzer No. 3, ca. 1918 1 contributing building.

The Catalyzer No. 3 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 6-8,10-11) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers. The interior of the west half of the 50 foot by 210 foot building was later adapted to house a fertilizer storage test area, but the structure is currently vacant. The building sits on a concrete slab foundation, has a partially exposed steel frame, and is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the wall openings contain brick infill or are covered by corrugated fiberglass panels. Concrete lintels and sills adorn each original window opening. All windows on the south elevation were replaced with three pairs of modern one-over-one double hung wood sashes. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows partially covered in corrugated fiberglass panels. The lower portion of the building is clad with a combination of concrete blocks, corrugated fiberglass panels, and louvered wooden vents. The east elevation features two doorways with concrete block infill, and two circular openings covered with wood. A pair of metal swinging doors and two single doors on the north elevation provide access to the building. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes.

10. Catalyzer No. 2, ca. 1918 1 contributing building.

The Catalyzer No. 2 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 6-9, 11) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers. The interior of the 50 foot by 120 foot building was later adapted to house a nitrogen fertilizer laboratory. The structure is currently vacant. The eastern half of the building is no longer extant. The building sits on a concrete slab foundation, has a partially exposed steel frame, and is clad with hollow clay blocks with red brick quoins and window surrounds. All the window openings are covered by corrugated fiberglass panels. Concrete lintels and sills adorn each original window opening. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows covered in corrugated fiberglass panels. The west elevation features a pair of metal swinging doors protected by a steel awning. Other fenestration includes a metal door on the north elevation, a doorway covered in sheets of steel on the west elevation, and a concrete block-infilled doorway on the south elevation. The south elevation also features a metal swinging door covered by a wooden shed roof supported by wooden posts. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes.

11. Catalyzer No. 1, ca. 1918 1 contributing building.

The Catalyzer No. 1 building originally functioned within the group of Catalyzer Buildings 1-6 (see also #s 6-10) where ammonia gas was converted into nitric acid. Each catalyzer building once housed 116 catalyzers. The interior of the west half of the 50 foot by 210 foot building was later adapted to house office space and a mineral laboratory. The building is currently vacant. The building sits on a concrete slab foundation, has a partially exposed steel frame, and is clad with hollow clay blocks with red brick quoins and window surrounds.All of the windows are covered by corrugated fiberglass panels. Concrete lintels and sills adorn each original window opening. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows partially covered by corrugated fiberglass panels. The east elevation features two doorways with concrete block infill. A pair of metal swinging doors protected by a steel awning on the west elevation and three metal swinging doors on the north and south elevations provide access to the building. A two-story room at the west end of the building once functioned as a meter room for the mixing of the air and gas, and features a monitor roof pierced by clerestory metal sashes.

12. Substation No.6, ca. 1918 1 contributing building.
Well 1 contributing structure.

Connected to the north elevation of the Catalyzer No. 6 (#6)building is an original electrical substation that provided power to the catalyzers. The building no longer contains electrical equipment. The rectangular shape building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the wall openings have been infilled with brick or covered with corrugated fiberglass panels. The split shed roof is covered with metal sheeting. The west elevation features an altered window opening that contains a central 10-light metal sash window. Concrete lintels adorn each window opening. A wooden swinging door on the east elevation provides access to the interior of the building. Located adjacent to the building along the west elevation is a brick well topped with wooden planks. Metal rungs provide interior access well.

13. Substation No. 5, ca. 1918 1 contributing building.
Well 1 contributing structure.

Located between Catalyzer No. 3 (#9) and Catalyzer No. 4 (#8), the building is an original electrical substation that provided power to the catalyzers. The building no longer contains electrical equipment,. The rectangular plan building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the wall openings have been concealed with brick infill or covered with fiberglass panels. The split shed roof is covered with metal sheeting. The west elevation features a central 25-light metal sash window. Three windows containing 15-light metal sashes pierce the north and south elevations. Concrete lintels and sills adorn each window opening. A set of double wooden Dutch doors on the east elevation provides interior access to the building. Located adjacent to the building along the west elevation is a brick well capped with a steel lid.

14. Substation No. 4, ca. 1918 1 contributing building.
Well 1 contributing structure.

Located between Catalyzer No. 1 (#11) and Catalyzer No. 2 (#10), the building is an original electrical substation that provided power to the catalyzers. The building no longer contains electrical equipment The rectangular plan building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds. Most of the window openings are enclosed with brick infill or corrugated fiberglass panels. The split shed roof is covered with metal sheeting. The west elevation features a central 25-light metal sash window. Three windows containing 15-light metal sashes pierce the north and south elevations. Concrete lintels and sills adorn each window opening. A set of double wooden Dutch doors on the east elevation provides access to the building. A circular red brick and mortar well sits just west of the building, and is topped with wooden planks. Metal rungs provide interior access.

15. Tin Shop, ca. 1918 1 contributing building.

Located between the Catalyzer Buildings (#6-12) and the Autoclave Building (#17), the Tin Shop originally functioned as a wash house and locker room. Later the building was used as chemical development storage and eventually converted into a tin shop. The building is currently vacant. The rectangular plan building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds. The building has a monitor roof covered with corrugated metal sheeting and is pierced by a continuous band of clerestory windows. A pair of wooden swinging doors protected by a steel awning provide access on the west elevation. The doorway is flanked on either side by a 15-light metal sash window covered by a scalloped-edge steel awning. This style is repeated in five windows on the south elevation, and seven on the north. A number of corrugated metal-clad modern additions project from the east elevation.

16. Boiler Plant, ca. 1918 1 contributing building.

Centrally located within the MSR, the boiler plant originally contained three coal-fired boilers, however the building is currently vacant. A radial brick chimney, which originally stood 225-feet tall but has recently been trimmed to 90-feet, serves as a dominating feature of the MSR is positioned on the east elevation of the original plant. The multi-level structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The north elevation features a concrete loading bay with a metal overhead door, which is protected by a corrugated steel-covered shed roof supported by steel posts. Fenestration includes operable 16-light, 24-light, and 32-light metal sash windows. Concrete lintels and sills adorn each window opening. A two-level concrete platform supported by concrete legs is attached to the north elevation. The east elevation features a small steel-framed addition that is constructed of hollow clay block and bricks and which is topped by a metal shed roof. A modern boiler is connected to the west side of the chimney and is steel-framed and clad in corrugated steel sheeting.

17. Autoclave Building, ca. 1918 1 contributing building.

Connected by metal pipes to the west elevation of the Boiler Plant (#16), the Autoclave building originally housed 56 autoclave ovens and 14 hoppers for cyanamide storage and processing. Each autoclave oven measured 21 feet tall. At peak production, the autoclaves were capable of mixing 2,000 gallons of sodium hydroxide solution with 8,000 pounds of cyanamide and 300 pounds of soda ash to produce one ton of ammonia gas. The building is currently vacant. The multi-level, T-plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The building is capped by three monitor roofs that are pierced by a continuous band of clerestory windows partially covered by corrugated fiberglass panels.

18. Pilot Plant Building, ca. 1918 1 contributing building.

Attached to the west elevation of the Autoclave building (#17), the Pilot Plant building once housed the pilot plant and a small office area. The building is currently vacant. The 2-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and painted hollow clay blocks with red brick quoins and window surrounds. The building is capped by three monitor roofs, each pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Concrete lintels and sills adorn each window opening, which are covered by corrugated fiberglass panels. A set of double metal doors, protected by a metal awning, on the west elevation provides access to the building.

19. Raw Materials/Product Building, ca. 1990 1 non-contributing building.

Attached to the west elevation of the Autoclave Building (#17), the Raw Materials/Product Building is a modern one-story rectangular plan warehouse that sits on a poured concrete foundation, is steel framed, and is clad in corrugated metal. The flat roof is covered in metal. A single metal overhead door on the northern and western elevations provide access to the building.

20. Paint Storage Building, ca. 1935 1 contributing building.

Located west of the Pilot Plant Building (#18), the Paint Storage Building is a one-story, three-bay rectangular plan building that once housed a small office as well as paint storage. The building is currently vacant. The steel-frame building sits on a continuous concrete foundation and features an exterior clad with brick veneer and a precast concrete slab roof topped with five metal rotary vents. Facing west, the façade is marked by a pair of centrally placed wooden doors, flanked on either side by a nine-light metal sash window with concrete sill and lintel, and a single wooden swinging door. This window type is repeated on the north and east elevations.

21. Substation No. 2, ca. 1918 1 contributing building.

Located south of the Autoclave Building (#17), substation No. 2 is an original electrical substation that once provided electricity to the autoclave, but is now vacant. The rectangular plan building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds.Most of the wall openings are concealed bybrick infill or corrugated fiberglass panels. The shed roof is covered with metal sheeting. Four 15-light metal sash windows pierce the east and west elevations. Concrete lintels and sills adorn each window opening. Access is achieved via a metal swinging door on the north elevation, and a pair of metal swinging doors topped by a ventilation fan and steel awning on the south elevation. Three metal louvered openings on the east and west elevations lie near the ground level and provide ventilation to the interior of the building.

22. Substation No. 20, ca. 1980 1 non-contributing building.

Located east of the catalyzer buildings (#s 6-11), substation no. 20 provides electrical regulation and distribution but is no longer in use. The one-story, one-bay, steel-framed structure sits on a concrete slab foundation, and is clad in brick veneer. The building has a flat roof covered with standing seam metal. The east elevation features a metal overhead and a metal swinging door to provide both pedestrian and vehicular access. Fenestration on the north elevation includes a metal swinging door and two rectangular metal louvered vents.

23. Nitric Acid Storage Tanks, ca. 1918 2 contributing structures.

Located east of the catalyzer buildings (#s 6-11), the Muscle Shoals Reservation originally featured 12 nitric acid storage tanks, of which two are extant. The structures were once housed within a roofed building, which is no longer extant. The round tanks are constructed of brick, and feature a domed brick roof. The walls of the tanks are faced with concrete.

24. Pipe Shop, ca. 1918 1 contributing building.

Centrally located within the MSR, the former blacksmith shop now functions as a pipe repair shop. The 1-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The building is capped by a monitor roof that is pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Concrete sills adorn each window opening, which are covered by corrugated fiberglass panels. Original doorways on the east and west elevations have been infilled with concrete blocks. Modern metal swinging doors and open bays on the north and south elevations provide access to the building.

25. Sheet Metal Shop, ca. 1918 1 contributing building.

Centrally located within the MSR, the former woodworking shop now functions as a sheet metal shop. The one-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window

surrounds. The building is capped by a monitor roof pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Concrete sills adorn each window opening, which are covered by corrugated fiberglass panels. Access to the building is achieved via open bays on the north, east and west elevations. An original doorway on the south elevation has been partially infilled with concrete blocks and replaced with a modern metal door.

26. Engineering Lab, ca. 1918 1 contributing building.

The engineering lab building originally functioned as an iron and brass foundry, and later housed the engineering laboratories. The building is currently vacant. The two-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The building is capped by a monitor roof pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Concrete sills adorn each window opening, which are covered by corrugated fiberglass panels. The openings on the east and west elevations are highlighted by concrete lintels. A one-story bay runs the length of the building along the north elevation. Window openings on the north elevation have been infilled with glass blocks with inset operable windows.

27. Machine Shop, ca. 1918 1 contributing building.

Centrally located within the MSR, the machine shop also houses a gas and diesel repair shop. The one-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The building is capped by two monitor roof that are pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Concrete sills adorn each window opening, which are covered by corrugated fiberglass panels. Openings on the east and west elevations are also marked by concrete lintels. Windows on the west elevation have been replaced with modern multi-light fixed vinyl sashes. Access to the building is achieved via overhead doors on each elevation.

28. Store House, ca. 1918 1 contributing building.

Centrally located within the MSR, , the former store house currently houses the shipping and receiving office, an electric shop, the chemical plant warehouse, and project operations storage. The one-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The roof features three monitors each with a continuous band of clerestory windows that are covered by corrugated fiberglass panels. Concrete sills and lintels adorn each window opening, which have been replaced with modern multi-light awning vinyl sashes. Access to the building is achieved via overhead doors on the north and south elevations that are covered by a full-width shed awning supported by metal brackets. The east elevation is marked by a single and a pair of metal swinging doors protected by a projecting shed awning supported by wooden brackets.

29. Equipment Shed, ca. 1990 1 non-contributing building.

Located between the Bath House (#30) and the Autoclave Building (#17), the equipment shed provides storage for outdoor equipment. The open steel-frame structure sits on concrete piers and has a gable roof covered in corrugated metal sheeting.

30. Bath House, ca. 1918 1 contributing building.

Centrally located within the MSR and located north of the equipment shed (#29), the bath house originally functioned as a locker and wash room area, but currently houses the operations support warehouse. The one-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The roof once featured a monitor, but has been removed. The low-pitch gable roof is covered with a ballasted built-up membrane. Concrete sills and lintels adorn each window opening, which have been replaced with modern multi-light vinyl sashes. Access to the building is achieved via overhead doors on the north and south elevations. The north, east and west elevations are marked by metal swinging doors protected by a projecting shed awning supported by wooden brackets.

31. Grinding Building/Wet Process Acid Pilot Plant, ca.1918 1 contributing building.

Located directly south of the L/N Building (#37) in the central core of the district, the Grinding Building and Wet Process Acid Pilot Plant was formerly the silo and hydrator building. Cyanamide entered via a conveyor network, which is no longer extant, from the L/N Building (#37) and was deposited into a 150 ton bin, then distributed to individual hydrators. An adjacent building housed 9 concrete silos, with a total storage capacity of 5,000 tons. The multi-level structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The low-pitch gable roof is covered with a ballasted built-up membrane. The eastern wing of the building is high bay space marked by a corrugated steel-clad shaft on its north elevation. Three window openings on each elevation with corrugated fiberglass panels infill mark this wing near its roof-wall junction. The two-story western wing features a monitor pierced by a continuous band of fixed clerestory metal sashes, partially covered by corrugated fiberglass panels. This wing is pierced on both stories by continuous window openings with corrugated fiberglass panels infill. Three overhead doors on the south elevation and a single overhead door on the west elevation provide access.

32. Admin/Bath House, ca. 1970 1 non-contributing building.

Located directly south of the Liquid Air Building (#33), the Admin/Bath House building provides office space and restrooms for employees. The one-story rectangular plan building sits on a concrete block foundation, is steel-framed and clad in a combination of hollow clay blocks and concrete blocks. The flat roof is covered in steel sheeting. Facing south, the façade is marked by a central pair of glass and metal swinging doors, protected by a flat metal awning

supported by square metal posts. West of the doorway, two full-length metal louvers provide ventilation.

33. Power Service Shop No. 2 (Liquid Air Building), ca. 1918 1 contributing building.

Located nearly one-quarter mile east of the L/N Building (#37), the Power Service Shop No. 2, formerly known as the Liquid Air Building, is on the eastern edge of the district and currently functions as a workshop. The building was originally used to distill air to extract nitrogen, which was then supplied to the cyanamide ovens in the L/N Building (#37). The one-story, rectangular plan building structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. All window openings feature corrugated fiberglass panels infill. The low-pitch gable roof is covered with a ballasted built-up membrane and features two monitors, each pierced by a continuous band of clerestory windows and covered by corrugated fiberglass panels. A molded concrete cornice adorns the east and west elevations. The north and south elevations feature clay block and red brick cornice decoration. Molded concrete covers the clay blocks on the lower portion of the building. Two open bay doors and a swinging metal door on the east elevation provide access to the building.

34. Utility Building, ca. 1990 1 non-contributing building.

Located directly north of the Power Service Shop No. 2 (#33), is a modern shed for equipment storage. The building sits on a concrete foundation, is steel-framed, clad in metal sheeting, and has a low-pitch gabled roof. The structure is marked by open bays on its north and south elevations.

35. Grounds Maintenance Shop (Mill Room), ca. 1918 1 contributing building.

Attached to the south elevation of the L/N Warehouse (#36), the Grounds Maintenance Shop originally housed the lime nitrogen mill room for the cyanamide ovens, and later functioned as a workshop. The building is currently vacant. The square plan building sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. All window openings are covered with corrugated fiberglass panels . The low-pitch gable roof is covered with a ballasted built-up membrane and features three monitors, each pierced by a continuous band of clerestory windows and covered by corrugated fiberglass panels. Two pairs of wooden swinging doors with concrete lintels provide access on the south elevation. The elevation also includes a third doorway infilled with hollow clay blocks, a nine-light operable metal sash, and a wooden swinging door protected by a metal awning. A cornerstone on the southeast corner reads "MARCH 13 1918".

36. L/N Warehouse, ca. 1918. 1 contributing building.

Situated between the north elevation of the Grounds Maintenance Shop (#35) and the south elevation of the L/N building (#37), the L/N Warehouse originally functioned as a cooling room for the cyanamide ovens, and later functioned as a workshop. The building is currently vacant.

The rectangular plan structure consists is steel-framed and clad in corrugated metal sheeting. The low-pitch gable roof is covered with a ballasted built-up membrane and features a single monitor marked by continuous metal louvers partially covered by corrugated fiberglass panels. A pair of corrugated metal swinging doors and a single metal swinging door on the east and west elevations provide vehicular and pedestrian access to the building.

37. L/N Building (Cyanamide Oven Building), ca. 1918 — 1 contributing building.
Well — 1 contributing structure.

The L/N Building, originally functioned as the cyanamide oven building and is currently vacant. The rectangular plan building is 250 feet wide and 520 feet long, and once contained 16 rows of ovens, with 96 ovens in each row, for a total of 1,536 ovens. The building sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. All window openings feature concrete sills and lintels and are covered with corrugated fiberglass panels . The low-pitch gable roof is covered with a ballasted built-up membrane and features five monitors, each pierced by a continuous band of clerestory windows covered by corrugated fiberglass panels. Two entrance portals with metal shed roofs mark the east elevation. Further access to the building is achieved via an open bay on the east elevation, a metal swinging door and an open bay on the north elevation, and two metal swinging doors and three open bays are located on the west elevation. A circular brick well is positioned near the north elevation of the building and is topped with a steel lid.

38. Projects Operation Office, ca. 1918 — 1 contributing building.
Well — 1 contributing structure.

Centrally placed within the MSR and located west of the Grounds Maintenance Shop (#35), the Projects Operation Office originally functioned as a locker and wash room area, but currently functions as office space. The one-story, rectangular plan structure sits on a concrete slab foundation, is steel-framed, and clad in a combination of concrete and hollow clay blocks with red brick quoins and window surrounds. The building original featured aa monitor roof, but this has been replaced by a low-pitch gable roof covered with a ballasted built-up membrane. Concrete sills and lintels adorn each window opening, which have been replaced with modern multi-light vinyl sashes. Access to the building is achieved via overhead doors on the north and south elevations. The north, east and west elevations are marked by metal swinging doors protected by a projecting shed awning supported by wooden brackets. A circular brick well is located along the north elevation of the building and is topped with a steel lid.

39. R/M Lab, ca. 1918 — 1 contributing building.

Located west of the L/N building (#37), the R/M Lab originally functioned as a locker and wash room space, and later as a raw materials laboratory The building is currently vacant. The rectangular plan building sits on a concrete slab foundation, is steel framed, and is clad with hollow clay blocks with red brick quoins and window surrounds. The building has a monitor roof pierced by a continuous band of clerestory operable multi-light metal sashes. A pair of wood paneled doors on the east elevation provide access and are protected by an awning supported by

wooden brackets. The doorway is flanked on either side by two operable 15-light metal sashes. This sash type is repeated in six windows on the north and south elevations. All window openings feature concrete sills and lintels.

40. Chemical Feed House, ca. 1947 1 contributing building.

Located in the northwest corner of the district boundary, the Chemical Feed House, designed by Roland A. Wank, originally functioned within the water treatment complex, but is currently vacant. The four-story, rectangular plan, International style building sits on a concrete foundation, is steel-framed, and clad in brick veneer. Facing south, the primary façade is marked by three metal swinging doors protected by metal hood awnings. The central door is flanked on either side by two one-over-one central pivot metal sashes, and the façade is further marked by seven one-light awning metal sashes near the roof-wall junction and a vertical band of similarly patterned metal sashes on the east edge. A concrete platform topped with a metal railing provides access to the south elevation. The east elevation is marked by an exterior end brick chimney, flanked to the south by a vertical band of one-light awning metal sashes, and to the north by a single one-light metal sash. The north elevation is marked by nine one-light awning metal sashes near the roof-wall junction and a projecting loading bay. The building has a flat roof covered in metal sheeting.

41. Environmental Research Center, ca. 1947 1 contributing building.

Located near the western boundary of the MSR, the Environmental Research Center, designed by Roland A. Wank (also known as the Chemical Engineering Building), originally functioned as office and laboratory space for the National Fertilizer Development Center. Presently, portions of the building are still used for offices. The multi-story, multi-bay, irregular plan building sits on a concrete foundation, is steel-framed, clad in brick veneer, and features a flat roof covered with metal sheeting. Facing west, the primary façade is dominated by a circular entrance wall marked by a two-story window wall. South of the entryway, the first-story is pierced by a series of ten fixed metal sash windows, and highlighted by a continuous flat metal awning that runs the length of the elevation. Metal lettering reading "TENNESSEE VALLEY AUTHORITY" adorns the south end of the façade near the roof-wall junction. Running perpendicular from the entryway, an office bay stretches west and is pierced by a continuous band of fixed metal sash windows. The north elevation of the office bay is comprised of a sloped window wall. Other fenestration on the building includes a two-light metal sash window with a lower hopper sash and metal and glass swinging doors. At the rear of the building, the east elevation features three loading dock areas marked by either metal overhead doors and metal swinging doors. Access to the loading areas is achieved via elevated ramps topped with metal balustrades.

42. Old Medical Building, ca. 1947 1 contributing building.

Located west of the L/N building (#37), the old medical building is currently vacant. Designed in the International Style, the one-story, two-bay building has a rectangular plan and sits on a concrete foundation. Overall, the steel-frame building features an exterior clad with wooden lap siding and a flat, stepped, roof covered in metal sheeting. Facing east, the façade features a

central recessed entry containing a pair of metal swinging doors. The main entrance is flanked to the south by a band of five one-over-one, double-hung wood sash windows. Additionally, each window is topped by a single-pane fixed light located near the roof line. This sash type is repeated on five window openings located along the south elevation. The southern elevation is also pierced by 17 one-over-one, double-hung wood sash and three fixed wood sash windows. A gable-roofed garage addition projects southward from this elevation. The north elevation is pierced by 25 one-over-one, double-hung wood sashes. A rectangular, perpendicular, bay projects from the west elevation and exhibits similar construction materials.

43. Service Building, ca. 1947 1 contributing building.

Located south of the Environmental Research Center (#41) on the western boundary of the MSR, the Service Building, designed by Roland Wank, originally functioned as office and work shop space, but is currently vacant. Designed in the International Style, the one-story, multi-bay, irregular plan building sits on a concrete foundation, is steel-framed, and clad with brick veneer. The building has a flat roof covered with prefabricated concrete slabs. Facing west, the primary façade is marked by a perpendicular 170-foot long flat metal awning supported by concrete piers. Fenestration on the façade includes a window wall of fixed over awning metal sashes. The entry bay and the southernmost bay also feature white porcelain-enameled spandrels. The northernmost bay on the façade features a flat metal-covered roof extension supported by steel beams, a centrally located metal and glass swinging door flanked by two fixed metal sashes, and a band of continuous fixed metal sashes below white porcelain-enameled spandrels. To the south, a recessed entryway provides further access to the building. In the rear, a triangular shaped bay contains a garage area and is pierced on its north elevation by four metal overhead doors below a ribbon of fixed metal sash windows. These doors are flanked to the west by four awning over fixed metal sashes. The building's east elevation is pierced by two pairs of metal awning sashes and six fixed over awning metal sashes.

44. Chemical Engineering Building, ca. 1947 1 contributing building.

Located south of the Service Building (#43) on the western boundary of the MSR, the Chemical Engineering Building originally housed office space and laboratories, but is currently vacant. Designed in the International Style, the five-story, single bay, rectangular plan building features steel-framed construction, and an exterior clad with brick veneer. Facing west, the primary façade is marked by a pair of recessed glass and metal swinging doors covered by a flat roof topped with metal sheeting and supported by brick columns. The façade is further pierced on each story by band of four one-light fixed over one-light awning metal sashes. A similar fenestration pattern is repeated on the east elevation. The north and south elevations feature broken bands of one-light sliding metal sashes on each story. Metal lettering reading “CHEMICAL ENGINEERING BUILDING” adorns the south end of the west elevation near the roof-wall junction. The building has a flat roof covered with prefabricated concrete slabs.

45. Scale House, ca. 1970 1 non-contributing building.

Located south of the catalyzer buildings (#s 6-11), the scale house functioned as a monitoring station for trucks delivering equipment and materials. A vehicle weight scale is positioned directly north of the building. The one-story rectangular plan building features a concrete slab foundation, steel frame construction, an exterior clad in standing seam metal, and has a metal shed roof. Access to the building is achieved via a synthetic swinging door on the east and west elevations. Fenestration includes a single window opening on the east and west elevations that contain fixed metal sashes. This sash type is repeated in three window openings located along the north elevation.

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [X] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B. Property is associated with the lives of persons significant in our past.
- [X] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark “x” in all the boxes that apply.)

- [ ] A. Owned by a religious institution or used for religious purposes
- [ ] B. Removed from its original location
- [ ] C. A birthplace or grave
- [ ] D. A cemetery

☐ E. A reconstructed building, object, or structure

☐ F. A commemorative property

☐ G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)
AGRICULTURE
ARCHITECTURE
ENGINEERING
INDUSTRY

Period of Significance
1918-1933
1933-1990

Significant Dates
1918
1933
1950

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder
Westinghouse, Church, Kerr, & Co., Inc.
Wank, Roland Anthony
Tennessee Valley Authority

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Muscle Shoals Reservation Historic District (MSRHD) located in the City of Muscle Shoals, Colbert County, Alabama, is significant under National Register Criterion A in the area of Agriculture, Engineering and Industry, and under National Register Criterion C in the area of Architecture. The buildings retain most of their original design features, and comprise a visually cohesive grouping of industrial buildings constructed between 1918 and 1951. The development of this district played an important role in national industrial and military history, and also represents important advancements in agricultural technology. The predominantly hollow clay block and brick-clad, monitor-roofed buildings from the earliest phase of construction represent early twentieth century industrial building design. The later, 1947-1951, construction phase consists primarily of buff-colored brick-clad, flat-roofed buildings designed by Roland A. Wank in the International style.

The first period of significance for the MSRHD extends from 1918, when the initial construction of the United States Nitrate Plant No.2 commenced, through 1933, when the property was transferred to the newly formed Tennessee Valley Authority. The second period of significance extends from 1933, when earlier buildings were adapted for fertilizer production, and later re-used during World War II for munitions production, through 1990, when large-scale fertilizer production for the National Fertilizer Development Center ceased. While the district continues to serve as office and workshop space, its importance diminished as fertilizer production ended and its buildings were vacated.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

U.S. Nitrate Plant No. 2

With the impending approach of World War I, the United States government began to take stock of its munitions supply and quickly realized that a dependence on Chilean guano-derived nitrates as a source for nitric acid would result in a munitions shortage. Guano contained high amounts of nitrogen, phosphorus, and potassium, and was wildly popular as a 'complete' fertilizer. Previously, multiple fertilizers needed to be mixed to produce a product of this potency[1]. After a meteoric surge in popularity, guano had become overharvested and easily accessible resources were soon depleted. The U.S. dependency on Chilean guano was a hindrance on munitions production, due to the high costs of shipping. As guano deposits were depleted, the price of nitrates skyrocketed. It became clear that it would be much cheaper to produce nitrates on American soil, especially if the process could be powered by Muscle Shoals water.[2] Also in its favor, Muscle Shoals was close to large lime phosphate deposits in southern

[1] Allbaugh 1956: 154.
[2] Daniel 1973: 151.

Tennessee, which could be mined and easily transported on the Tennessee river for nitrate production.

In 1907, the American Cyanamid Company was incorporated by Frank Washburn and Charles Baker, and aimed to develop the production of American nitrates. At the same time, the Muscle Shoals Hydro-Electric Power Company, organized by John W. Worthington, had plans to construct a dam at the shoals, which could power the nitrate plant using hydroelectricity. Washburn visualized a collaborative program between the federal government and private business to develop Muscle Shoals as a hub of industry, foreseeing the region connected by a network of dams, locks, and canals to facilitate movement of goods[3]. Collaboration did not come easy for Washburn, however, and he was unable to broker a deal with the federal government for the development of Muscle Shoals. Washburn went on to develop a site near Niagara Falls instead, establishing North America's first cyanamide plant in 1909[4]. Community leaders continued to push for development at Muscle Shoals, however, and in 1915 Worthington invited a large Congressional party and other prominent national figures to visit the area to court their support and stress the importance of a cooperative effort between government and private enterprise. The visit included river excursions, a barbecue, an afternoon "thé dansant" in nearby Florence, an orchestral performance, and speeches. These efforts initially seemed to work, but interest in MSR quickly tapered off, and the project was once again sidelined[5].

As World War I gained momentum, the American Cyanamid's Niagara Falls nitrate plant struggled to keep up with demand, and U.S. anxieties over the nitrate supply were heightened[6]. Adding to the U.S.'s concerns was the possibility of conflict with German submarines off the coast of South America, and interfering with the purchase of Chilean nitrates. To alleviate these pressures, on June 3, 1916, the National Defense Act was signed, authorizing the president to select sites, construct dams and navigation locks, and erect nitrate plants[7]. The Muscle Shoals Association petitioned President Woodrow Wilson to select Muscle Shoals as a potential site. In 1917 Muscle Shoals was chosen, and the U.S. government purchased the property and its riparian rights from Muscle Shoals Hydro-Electric Power Company, a subsidiary of the Alabama Power Company.

The United States Government contracted with the Air Nitrates Corporation, a subsidiary of American Cyanamid, for the construction of the plant in 1917, and construction was begun in February of 1918. The designers and engineers of the construction project were Westinghouse, Church, Kerr & Company, Incorporated. The plant included 73 nitrate plant buildings, 2,165 temporary buildings, and 190 industrial village buildings[8]. The construction included 19 miles of road, 4 miles of trolley line, a sewage disposal plant, and a water filtration plant that could serve a population of 22,000. The project ultimately cost $63,000,000 and used over 14,000 tons of steel, 685 miles of cable, and 223 miles of pipe[9].

[3] Coffey 1992: 18.
[4] Daniel 1973: 154; Coffey 1992: 17.
[5] Daniel 1973: 169-171.
[6] Coffey 1992: 26.
[7] Daniel 1973: 174-175.
[8] Coffey 1992: 34.
[9] ibid: 72.

Raw limestone for the plant was quarried from Waco Quarry in Russelville, Alabama, and brought to the Muscle Shoals Reservation where it was burned down to lime in seven brick kilns coated in steel. The kilns were located at the northernmost edge of the property, but are no longer extant. [10] The lime was mixed with dry coke and, with high electrical currents, converted to carbide within the carbide furnace building, which is also no longer extant. From here, the carbide was transferred to the cyanamide oven building (#37), which once contained 16 rows of ovens, with 96 ovens in each row. Each cylindrical oven could cook 1,600 pounds of carbide at once. The carbide was cooled in the cooling room (#36), before being transferred to the mill room (#35). The product was transferred from the mill room to the catalyzer buildings (#s6-11) which each contained 116 catalyzers. The product left the catalyzers and passed into a series of oxidation and absorption towers to the east, which are no longer extant. Here, the gas was converted to nitrogen peroxide, before being transferred to the ammonium nitrate buildings. The five ammonium nitrate buildings, of which three are extant (#s1, 4, 5), housed evaporation pans where liquid nitrate was evaporated down to ammonium nitrate remnants, and allowed to cool. Each building processed 60 tons of ammonium nitrate each day[11]. The nitrate was packed into paper-lined barrels that could each hold 250 pounds of the nitrate. The barrels were next transported to a shell-loading facility, where a mixture of 80 percent nitrate and 20 percent TNT was mixed and packed into shells[12].

The entire process involved five major steps:

1. Production of carbide from lime and coke.
2. Production of cyanamide or lime nitrogen from the carbide and nitrogen.
3. Production of ammonia gas from cyanamide or lime nitrogen.
4. Production of nitric acid from ammonia gas.
5. Production of ammonium nitrate from nitric acid and ammonia gas.[13]

The reservation acted as a collection of smaller plants, each performing a complicated chemical process, connected to form a large-scale operation. Buildings within the nitrate plant reservation each had a specific function within this 5-step process, and buildings were laid out linearly from north to south, to allow ease of movement of chemical materials from one building to the next.

Labor for the building and operation of the nitrate plant and its associated structures was provided by an army of approximately 23,000 workers. An infrastructure was quickly put into place to support this rapid influx of laborers into the Muscle Shoals area, beginning with the First Quarters complex for the housing of Army Corps of Engineers and War Department officers. These quarters were used by the TVA as office space until the 1970s[14]. The three nearby worker villages consisted of over 100 bunk houses, 200 cottages, and 300 family tents, schools, parks, and churches. The village exploded so rapidly, workers constructed their own barracks while

[10] *Architecture and Building* 1919: 72.; Coffey 1992: 43.
[11] *Architecture and Building* 1919: 72.; Coffey 1992: 43-53.
[12] *Architecture and Building* 1919: 72
[13] ibid.: 71.
[14] Shaw 1994:28; Thomas et al. 2008

sleeping in temporary tents[15]. Within a matter of months, Muscle Shoals had become the fourth largest town in Alabama, and the population went from a population of 300 in January 1918 to 21,000 by August of that same year[16]. During the peak of activity at the nitrate plant site, there were 23 mess halls employing nearly 1,000 to prepare meals. Conditions of the rapidly expanding town were initially difficult, and the area was plagued with pneumonia, typhoid, malaria and the Spanish influenza[17]. Eventually, this village contained movie houses, hotels, pool halls, laundries, churches, hospitals, and a fire and police station[18]. A municipal hog farm raised 1,000 hogs on the waste incurred by the village mess halls. The villages were segregated with separate white and Negro facilities. According to an article in *Cayton's Weekly*, Booker T. Washington Jr., son of the noted author and orator Booker T. Washington, was hired in 1918 to serve as a claims adjuster, representing the more than 9,000 black employees at the plant[19].

Following a burst of rapid construction activity and two brief production periods, ending in February 1919, the nitrate plant sat idle for the following 14 years. Unsure what to do with the incomplete dam and nitrate plant, the government sought purchase bids, of which there were many[20]. The most infamous offer came from Henry Ford, who submitted an offer to the government in 1921, for the lease of the MSR for 100 years at a cost of $28 million paid over six years[21]. Ford's proposal was the source of heady debate; proponents claimed he was offering an unselfish public service, while detractors claimed it was a violation of national water power policy, and failed to provide for public regulation of rates and the distribution of power.[22] Ford's proposal was accepted by the House, but was then subjected to a series of hearings before the Senate Agricultural Committee and the House Military Committee. These hearings were attended by groups representing southern industrial firms, civic organizations, and industrial development associations, who preferred public ownership of the property and stressed the need for cheap water to encourage industrial growth in the South.[23] While the federal government seesawed on his offer, Ford visited the site with Thomas Edison to announce his plan for a linear city along the Tennessee River from Tuscumbia to Decatur. This plan was strongly opposed, however, by multiple audiences, including President Calvin Coolidge, Senator George Norris of Nebraska, the National Fertilizer Association, and competing industrialists. However, Ford eventually withdrew his offer in 1924, after a lengthy period of governmental deliberation and eventual opposition[24].

By 1926, the federal government was again trying to lease out the MSR property, and a proposal was submitted by the Associated Power Companies of the South, a coalition of 13 corporations[25]. At this time, the conservationist movement led by Senator Norris rose to the forefront of the discussion. Norris lobbied for governmental control of hydroelectric facilities,

[15] *Florence Times* 1918; Ford 2000.
[16] *Adair County News* 1920.
[17] ibid.
[18] Thomas et al. 2008; *Architecture and Building* 1919: 72; Ford 2000.
[19] *Cayton's Weekly* 1918.
[20] ibid.: 179.
[21] Gatlin 1978:101– 102; Renegar 1975:59–60; Thomas et al. 2008.
[22] Hubbard 1961: 112-113.
[23] ibid.: 129.
[24] *Times Daily* 1993; Gatlin 1978: 103-106.
[25] *Times Daily* 1993.

and proposed a bill in 1928 that passed the House, but was ultimately vetoed by President Coolidge, who allowed the constitutional time limit on the bill to expire.[26] The Republican Coolidge disliked the economic principles in the bill, particularly provisions permitting the government distribution and sale of power directly to municipalities. After the failure of Norris' bill, a series of proposals and bills were introduced and subsequently failed to pass the Republican-controlled White House.[27] It was not until the 1932 election of Franklin D. Roosevelt that Norris was confident a Muscle Shoals bill could be successful. In spring of 1933, he introduced a new bill to Congress providing for public operation of the nitrate plant and Wilson dam, and his influence led to the signing of the Tennessee Valley Authority Act by Congress and President Roosevelt in May 1933.[28]

Tennessee Valley Authority

Following the signing of the TVA Act, the U.S. Nitrate Plant No. 2 and Wilson dam were turned over to the new federal agency. The TVA was directed to launch a national fertilizer development program that would utilize the nitrate plant in peacetime and wartime. Among the agency's larger goals was to get the most out of natural resources within the region by harnessing water power, extracting local limestone and phosphate, and maximizing crop outputs in southern farmlands[29]. To achieve their goals, the TVA hired numerous local workers, paying out $750,000 in wages during one 1935 pay period[30]. Workers were housed in villages near Wilson Dam, and the area experienced significant growth, with a 15 percent population increase between 1930 and 1940 (from 29,860 to 34,093 individuals, respectively)[31]. Two Civilian Conservation Corps camps were constructed to provide worker housing, and new power production facilities helped bring the plant and dam up to date, and prepare the plant for its new focus on peacetime fertilizer production. These new additions ranged from small-scale chemical research laboratories to demonstration-scale facilities, including an electric-furnace phosphorus plant, concentrated superphosphate and calcium metaphosphate fertilizer plants, a synthetic ammonia plant, nitric acid plants, and an ammonium nitrate fertilizer plant"[32]. In addition, a nursery and greenhouses were built at the southern end of the reservation. These structures are extant, but not part of the proposed historic district.

The malleability of nitrogen and phosphorus allowed the operation of the plant during both peacetime and wartime[33]. Nearly all military explosives are formed by nitrogen compounds. When nitrogen is removed from the air and treated with ammonia, it can either be transformed into explosives, or fertilizer. Phosphorus derived from phosphate rock also has dual uses; it can spontaneously burn and produce dense smoke, or the compound can be manipulated to form phosphate fertilizer. Use of phosphorus was a more economical method of soil fertilization, rather than nitrates, because it was readily available from local sources and had a higher yield[34].

[26] Hubbard 1961: 234.
[27] ibid.: 313.
[28] ibid.: 314-315.
[29] Allbaugh 1973: 152.
[30] Ford 1994a:7-8; Thomas et al. 2008
[31] United States Census Bureau 2013.
[32] Allbaugh 1973: 155.
[33] ibid.: 153.
[34] ibid.: 155.

The cyanamide process became unnecessary, and four electric furnaces formerly used for calcium carbide production were adapted for elemental phosphorus production[35].

As World War II loomed closer, and U.S. involvement became more inevitable, President Roosevelt saw the growing need for munitions-level ammonium nitrate production[36]. The TVA coordinated with the War Department to develop a program for the production of ammunition from red phosphorus, using the Haber-Bosch synthesis process and requiring the construction of a new ammonia plant. Within its pilot plants, the TVA developed research programs for the derivation of aluminum oxide from clay, and the creation of an aluminum and silicon alloy, derived from clay[37], which could be used for munitions in place of other, more expensive, alloys. With a price tag of $7.7 million, the new ammonia plant was constructed by August 1942, and could produce 180 tons of ammonia each day. At the same time, two new phosphorus furnaces, a water treatment plant and gasification plant were constructed[38]. Of the original water treatment plant, only the Chemical Feed House (#40) is extant. By the end of the war, the TVA was producing 30,000 tons of phosphorus each year, accounting for 60 percent of all phosphorus used in the war effort, and production of ammonium nitrate was high as well. The facility produced 58,000 tons of military-grade elemental phosphorus, 100,000 tons of triple superphosphate fertilizer for domestic use. In addition, 85,000 tons of the triple superphosphate fertilizer was also exported to Allied nations for agricultural cultivation[39].

Following World War II, the TVA continued fertilizer production under the auspices of the new National Fertilizer Development Center (NFDC). With the establishment of the NFDC, new laboratories and offices were constructed on the MSR, designed by former TVA Chief Architect Roland A. Wank, discussed further below. The new buildings were dedicated in November of 1950, and the NFDC continued large-scale fertilizer production and distribution. In 1952, the TVA produced 132,000 tons of concentrated superphosphate, 33,000 tons of calcium metaphosphate, 15,000 tons of fused tricalcium phosphate, and 197,000 tons of ammonium nitrate[40]. Using test-farms, the NFDC conducted demonstration-scale research. While primarily concentrated in the Tennessee Valley, a total of 16,655 test-farms were located in 28 states[41].

During this period, the TVA maintained its relationship with the military through the beginning of the Cold War, as the facility was selected by the Chemical Corps of the U.S. Army to research the production of sarin "nerve" gas, and continued to supply elemental phosphorus to the Army[42]. To house this research, the Phosphate Development Works (PDW) complex was constructed under the supervision of the Army Corps of Engineers in the northeast quadrant of the MSR, and completed in 1952. Limited production began immediately, with TVA staff involvement that steadily increased as the plant became fully operable. The PDW ceased

[35] Thomas et al. 2008.
[36] FSPL 1985: 80-81.
[37] Allbaugh 1973: 156-157.
[38] TVA 1947; Thomas et al. 2008
[39] Young and Brown 1976:24–25, 28; Thomas et al. 2008
[40] Allbaugh 1973: 158.
[41] ibid.: 165.
[42] ibid.: 159.

operation and was shut down in 1957, when existing nerve gas supplies for defense were determined to be sufficient[43].

On May 18, 1963, the TVA celebrated its 30th anniversary with a celebratory ceremony at the MSR. The climax of the ceremony was a speech given by President John F. Kennedy before 15,000 spectators in front of the Environmental Research Center[44]. Kennedy's visit to the South came during the height of the civil rights movement, when tensions between whites and blacks had come to a head in Alabama, with Governor George Wallace's insistence on school segregation. Kennedy subtly referred to this issue during his speech, encouraging the audience, which included Gov. Wallace, "to reject the temptations of prejudice and violence, and to reaffirm the values of freedom and law on which our society depends"[45]. Prior to this meeting, President Kennedy sent 3,000 federal troops to Alabama to settle the Birmingham riots, a decision Gov. Wallace was publicly critical of[46]. The President celebrated the TVA's nationally significant achievements in electrification, job creation, agricultural development, and the establishment of recreational areas. "Only a great national effort by a great people working together can explore the mysteries of space, harvest the products at the bottom of the ocean, and mobilize the human, natural, and material resources of our lands"[47].

Through the 1960s and 1970s, the NFDC continued developing new fertilizer technology and formulations, and its research expanded to agricultural development in Third World nations under the auspices of the newly formed International Fertilizer Development Center (IFDC). Established in 1976, the IFDC focused their research on the improvement of chemical fertilizers, particularly within tropical agricultural zones, and the production of fertilizer from non-petroleum resources. The IFDC also promotes the recycling and better usage of organic waste in developing nations[48]. As government funding declined, TVA's fertilizer research lessened greatly in scale. Shifting environmental concerns and conservation efforts in the late 1980s led to the renaming of the MSR to the National Fertilizer and Environmental Research Center. The 1990s saw the termination of TVA fertilizer production, and the cleanup of chemical contaminants on the property became the focus of activities on the MSR. The Environmental Research Center remained active, conducting research projects for the TVA as well as within the private sector. The IFDC continues to operate on the MSR property, even as the TVA's own fertilizer research has been shut down[49].

Roland A. Wank and TVA Architecture

As part of establishing a modern and positive image, TVA gave a great deal of latitude to its architects on what was essentially a large-scale engineering project. The agency hired many young and progressive minded architects of the time from across the nation that were open to the emerging tenants of modern architecture. Although TVA’s Office of Architecture viewed its

[43] TVA 1955; Thomas et al. 2008
[44] TVA 2011: 255.
[45] Kennedy 1963.
[46] TVA 2011: 257.
[47] Kennedy 1963.
[48] IFDC 2013.
[49] TVA n.d; Thomas et al. 2008

members as a team, Hungarian architect and engineer Roland A. Wank (1898-1970), played a central role in influencing the design of TVA's properties, and at MSR designed the Chemical Feed House (#40), the Service building (#43), the Environmental Research Center (#41), and the Chemical Engineering Building (#44). According to Macy, Wank was "the chief architect responsible for the visual appearance of all TVA projects from 1933 until his departure eleven years later".[50]

Trained in his native Hungry, Wank established an impressive resume before economic turmoil in Europe led to his decision to immigrate to the United States in 1924. While in Hungry, Wank studied architecture at the Academy of Fine Arts in Budapest (1916-1918) and later at the Royal Technical University (1918-1919). In 1919, Wank attended the Technical University of Brno, Czech Republic. It is here that Wank was introduced to the emerging modernist movement that delved into concepts such as cubism, functionalism, and nationalism within architecture. Set within the framework of post-World War I Europe where countries sough to remove the cloak of old empires in exchange for democratic governments, young architects viewed "new" architecture as a progressively inspired platform that could act as a transformative tool in improving the economic and social order of Europe. By the completion of his studies in 1921, Wank was an ardent believer in modernist ideals.[51]

Following his arrival to the United States, Wank joined Fellheimer and Wager in 1927, but soon moved onto Springsteen & Goldhammer where he served as project architect on the Amalgamated Dwellings (1929) located in the Lower East Side of New York City. Commissioned by the Amalgamated Housing Corporation, the project represented the essence of modernist ideals as it combined modern architecture with a social agenda to provide housing for the garment-workers union. The project won the American Institute of Architects (AIA) New York Chapter Gold Modal in 1930 and reinforced to Wank the social benefits of modern architecture to society.[52]

Upon joining TVA in 1933, Wank made an immediate impact on the agency's approach to architectural design. Despite the emergence of the modern architectural movement, the prevailing trend among architects was to design industrial buildings with an emphasis on symmetrical façades marked with regular use of exterior ornamentation and embellishments. The lasting effect was to project a sense of power and permanence through the employment of columns and materials such as stone and brick. However, preparing for TVA's first project, Norris Dam, Wank discarded what he viewed as antiquated architectural perceptions and wasteful use of material. In exerting his modernistic ideals, Wank stripped all ornamentation and classically inspired features from drawings initially prepared by the Army Corps of Engineers.[53]

In April 1940, in an effort to promote the agency and its architecture, TVA partnered with the Museum of Modern Art (MOMA) in New York for an exhibition entitled, *TVA Architecture and Design.*[54] The MOMA exhibit showcased TVA's architecture through

[50] Macy 2007: 29.
[51] ibid.: 26-47.
[52] ibid.: 26-47.
[53] Crawford 1970: 7-8.
[54] Newmeyer 1941: 1.

illustrations, graphic diagrams, photographs and scale models of its various dam complexes. Although the exhibition in New York ended on June 8, it went on a national tour as part of MOMA's Department of Circulating Exhibitions. The national tour served to promote both TVA as a government agency and as a leader of modernist architectural design to the general public.[55]

In 1944, Wank left TVA to join the architectural firm of *Fellheimer & Wagner*. Despite his departure, TVA continued its relationship with Wank by hiring *Fellheimer & Wagner* to design the Chemical Engineering Building (#41) (now known as the Environmental Research Center [ERC]) at Muscle Shoals, Alabama. Completed in 1950, the ERC continued TVA's tradition of embracing modern architecture through the use of exterior walls devoid of ornamental embellishments, rounded bays, and large window walls. Unlike previous buildings designed by Wank, the ERC exhibits an exterior largely clad with a brick veneer. This design feature would be a common trait in ensuing administrative buildings associated with TVA's coal-fired plants constructed in the proceeding decades. Consistent with earlier TVA buildings, the interior of the ERC is highlighted by terrazzo floors, circular-shaped lobbies, aluminum fittings. Through Wank's leadership, modernism became the architectural identity of TVA which would carry over into the post-World War II era.

Integrity

The Muscle Shoals Reservation Historic District is a cohesive complex of industrial buildings that are nationally and internationally significant for their role in agricultural and industrial development, particularly during the first and second World Wars. The district has retained much of its original appearance and continues to convey the history of the complex. While most buildings do not retain their original use, most have not been significantly renovated or readapted. Only two buildings, the Bath House (#30) and the Projects Operation Office (#38) have been renovated. All three buildings feature modern replacement windows reminiscent of the originals, updated interiors, and the removal of original roof monitors. The majority of buildings within the district retain most of their character-defining details, including façades, window sashes, roof monitors, and other design details from the periods of significance.

Overall, however, the physical integrity of the buildings is poor due to neglect. Neglect in recent years due to building vacancy has led to leaking roofs and general disrepair, which in turn causes structural and interior damage, and invites animal activity. According to a structural evaluation undertaken by TVA in 1992, nearly all structures featured replacement roofing material, which has since fallen into disrepair itself. All buildings dating to the original 1918 construction phase originally featured slate roof tiles, but these have been replaced with a built-up ballasted membrane. Many buildings have been subjected to concrete block and corrugated fiberglass panels in most (if not all) window openings. Due to neglect, in some cases the corrugated fiberglass panels have become damaged and/or lost, and windows are now simply open to the elements.

[55] Newmeyer 1941: 1.

Non-contributing buildings to the district include the Scale House (#45), Bulk Storage building (#2), Substation No. 21 (#3), the Raw Materials/Product Building (#19), Substation No. 20 (#22), the Equipment Shed (#29), the Admin/Bath House (#32), and the Utility Building (#34) due to their modern construction dates and failure to showcase architectural characteristics in keeping with the rest of the Muscle Shoals Reservation Historic District.

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____ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
_X__ recorded by Historic American Engineering Record # _AL-46_____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

_X___ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
__X_ University
____ Other
Name of repository: _Alabama Historical Commission; University of North Alabama

Historic Resources Survey Number (if assigned): _____

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10. Geographical Data

Acreage of Property __173_____

Use either the UTM system or latitude/longitude coordinates

Latitude/Longitude Coordinates
Datum if other than WGS84:_____
(enter coordinates to 6 decimal places)

1. Latitude: 34.776464 Longitude: -87.653003
2. Latitude: 34.775780 Longitude: -87.641334
3. Latitude: 34.773524 Longitude: -87.641469
4. Latitude: 34.773559 Longitude: -87.645004
5. Latitude: 34.766745 Longitude: -87.645514
6. Latitude: 34.766859 Longitude: -87.650654
7. Latitude: 34.772026 Longitude: -87.650291
8. Latitude: 34.772140 Longitude: -87.652942

Verbal Boundary Description (Describe the boundaries of the property.)

The boundary of the Muscle Shoals Reservation Historic District is shown on the accompanying site plan entitled "Muscle Shoals Reservation Historic District Boundary". The National Register Boundary for the Muscle Shoals Reservation Historic District includes 43 buildings and seven structures bounded by Tennessee Valley Authority service roads.

Boundary Justification (Explain why the boundaries were selected.)

The National Register boundary for the Muscle Shoals Historic District includes those properties that are historically associated with the industrial complex during its periods of significance (1918-1933, 1933-1990) and retain adequate integrity to portray their relationship to the historic district. The boundary encompasses all significant resources and features that comprise the district, as well as eight non-contributing resources. The boundary was drawn based on negotiations and agreement between the Alabama Historical Commission and the Tennessee Valley Authority.

11. Form Prepared By

name/title: _Meghan Weaver, Preservation Planner_____
organization: _Tennessee Valley Archaeological Research_____
street & number: _2211 Seminole Drive, Ste. 302_____
city or town: Huntsville_____ state: ___AL_____ zip code: 35805____
e-mail__mweaver@tvaresearch.com_____
telephone:_401-527-2706_____
date:__September 20, 2013_____

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property: Muscle Shoals Reservation Historic District
City or Vicinity: Muscle Shoals
County: Colbert **State**: Alabama
Photographer: Meghan Weaver, Tennessee Valley Archaeological Research, Huntsville, AL
Date Photographed: August 12-13, 2013

Description of Photograph(s) and number, include description of view indicating direction of camera:

All digital images labeled as follows: AL_ColbertCounty_MSRHD_#.tif

0001. Building 2A (#5) northwest corner. Camera facing southeast.
1 of 36.

0002. Building 3A (#4) southeast corner. Camera facing northwest.
2of 36.

0003. Building 5A (#1) and Bulk Storage Building (#2). Camera facing northwest.
3 of 36.

0004. Building 5A (#1) southeast corner. Camera facing northwest.
4 of 36.

0005. Autoclave building (#17) and boiler plant (#16). Camera facing north.
5 of 36.

0006. Autoclave building (#17) and Substation No. 2 (#21). Camera facing northwest.
6 of 36.

0007. Bath House (#30) southwest corner. Camera facing northeast.
7 of 36.

0008. Boiler plant (#16) and Autoclave building (#17). Camera facing south.
8 of 36.

0009. Catalyzer buildings 1-6 (#s6-11). Camera facing north.
9 of 36.

0010. Catalyzer buildings 1-6 (#s6-11). Camera facing northeast.
10 of 36.

0011. Muscle Shoals Reservation overview including Boiler Plant stack (#16), Autoclave building (#17), Pilot Plant building (#18), and catalyzer buildings (#s6-11). Camera facing northeast.
11 of 36.

0012. Catalyzer buildings 1-6 (#s6-11). Camera facing southwest.
12 of 36.

0013. Chemical Engineering building (#44) and Service building (#43). Camera facing south.
13 of 36.

0014. Chemical Engineering building (#44) southwest corner. Camera facing northeast.
14 of 36.

0015. Chemical Feed House(#40) southeast corner. Camera facing northwest.
15 of 36.

0016. Engineering Lab (#26), Autoclave building (#17), and Boiler Plant (#16). Camera facing east.
16 of 36.

0017. Engineering Services building (#42) northeast corner. Camera facing southwest.
17 of 36.

0018. Environmental Research Center (#41) façade. Camera facing northeast.
18 of 36.

0019. Grinding building (#31) and Grounds Maintenance Shop (#35). Camera facing northwest.
19 of 36.

0020. Power Service Shop No. 2 (#33) southeast corner. Camera facing northwest.
20 of 36.

0021. L/N building (#37), L/N warehouse (#36) west elevation. Camera facing east.
21 of 36.

0022. L/N building (#37), L/N warehouse (#36), and Grounds Maintenance Shop (#35). Camera facing east.
22 of 36.

0023. Machine shop (#27) northeast corner. Camera facing southwest.
23 of 36.

0024. Paint Storage building (#20) and Pilot Plant building (#18). Camera facing east.
24 of 36.

0025. Pipe Shop (#24) southeast corner. Camera facing northwest.
25 of 36.

0026. Projects Operation Office (#38) southwest corner. Camera facing northeast.
26 of 36.

0027. R/M Lab (#39) southeast corner. Camera facing northwest.
27 of 36.

0028. Service building (#43) façade. Camera facing south.
28 of 36.

0029. Sheet Metal Shop (#25) northwest corner. Camera facing southeast.
29 of 36.

0030. Store House (#28) northeast corner. Camera facing southwest.
30 of 36.

0031. Substation No. 2 (#21) with Boiler Plant (#16) and Autoclave (#17) buildings in background. Camera facing northeast.
31 of 36.

0032. Substation No. 5 (#13) and Catalyzer No. 4 building (#8) . Camera facing southeast.
32 of 36.

0033. Substation No. 20 (#22) and Nitric Acid Storage Tanks (#23). Camera facing northeast.
33 of 36.

0034. Muscle Shoals Reservation overview including Chemical Engineering building (#44), Engineering Lab (#26), workshops (#s 24, 25, 27), and Catalyzer No. 6 (#6). Camera facing north.
34 of 36.

0035. Muscle Shoals Reservation overview including Autoclave building (#17), Equipment Shed (#29), and Grinding building (#31). Camera facing west.
35 of 36.

0036. Muscle Shoals Reservation overview including the Engineering Lab (#44) and workshops (#s 24, 25, 27). Camera facing northwest.
36 of 36.